

# AMERICAN ARTISAN

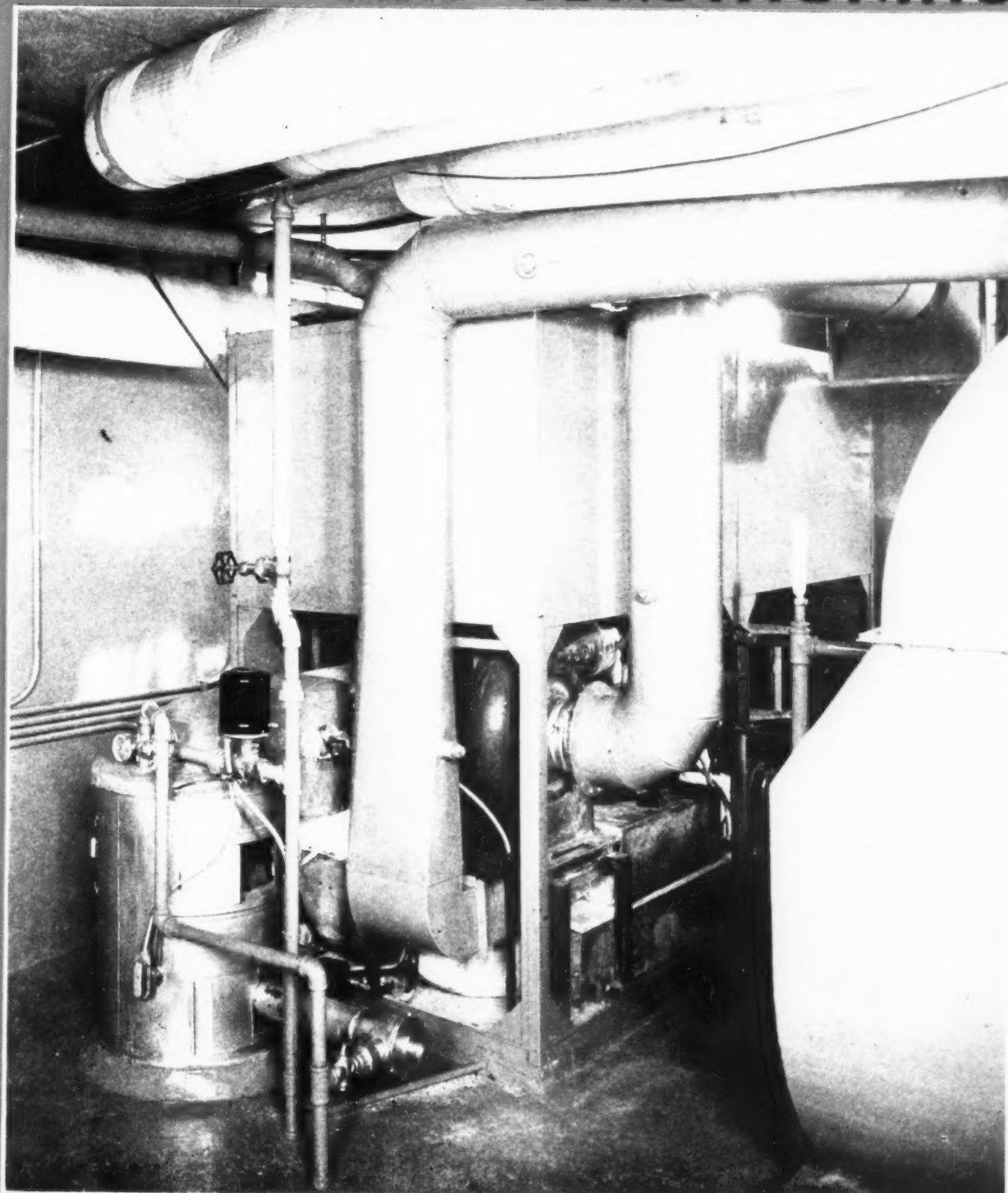
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CONTRACTING • AIR CONDITIONING

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Heating



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AMERICAN ARTISAN



*Ten tons of Galvanized Toncan Iron Sheets was installed in the ventilating system of the Auburn-Cord Building, Los Angeles, Calif.*

WHEN the Newman Heating and Ventilating Co., Los Angeles, installed the ventilating system in the new Auburn-Cord Building, Los Angeles, they used ten tons of Toncan Iron Galvanized Sheets. Their reasoning probably followed this line of thought—a beautiful building, designed for many years of service, to give comfort to automobile prospects, company executives, salesmen and service men, deserves the finest ventilating sheets that money can buy. Their experience with Toncan Iron over many years made the selection an easy matter.

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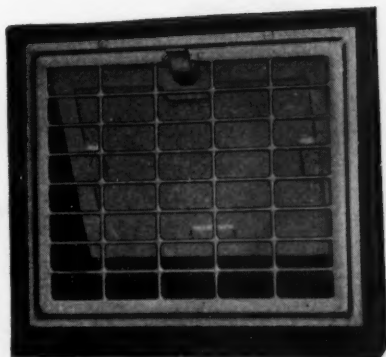
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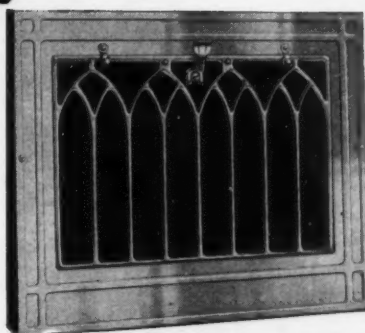


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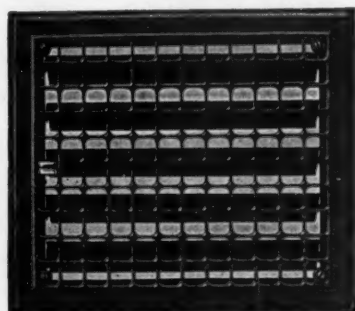
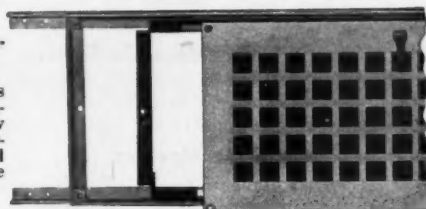
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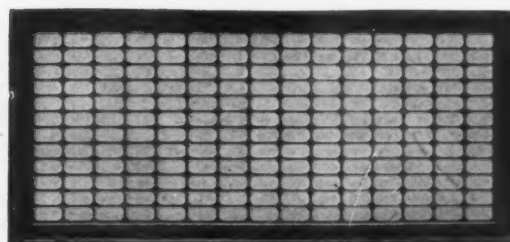
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# AMERICAN ARTISAN

With which is merged

**FURNACES  
SHEET METALS**

AND

**Warm-Air  
Heating**

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Founded 1880

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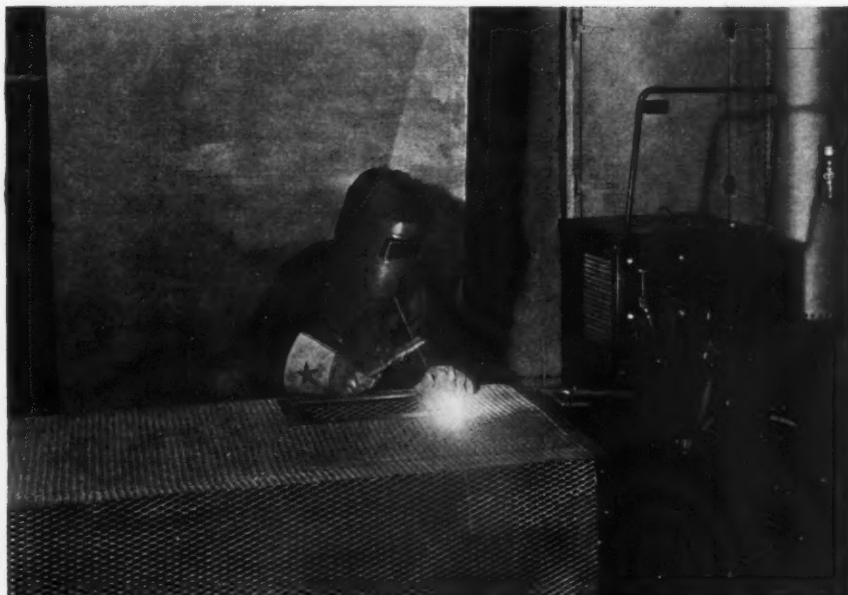
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*More than 7,000 copies of this issue are being distributed.*



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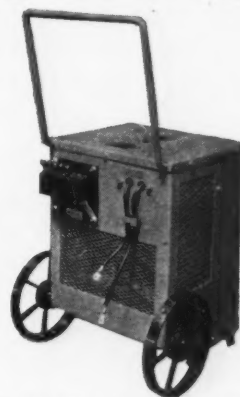
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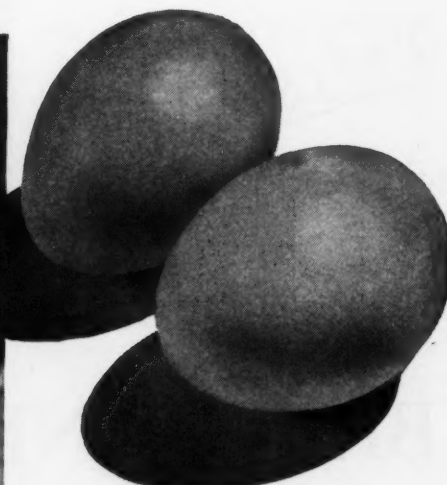
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AND HEAT RESISTING  
STEEL SHEETS  
AND LIGHT PLATES

*This Company manufactures a full line of high grade Black and Galvanized Sheets, Special Sheets, Tin and Terne Plates for all known purposes.*



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HAS FLOWERED IN AMERICA IN A UNIQUE  
AND UNMATCHED INSTITUTION ~ ~ ~

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## *The American Business Paper*

---

~ ~ ~ **W**HAT freedom of speech in matters of general interest has meant in the development of our democratic institutions, is matched in the field of business by the business paper. No such swift development of business technique, and particularly no such swift distribution of products, and information about products, could have taken place without a free and independent business press. It is one of the vital reasons for our tremendous commercial development in the United

States, a fact which may be verified by a comparative study of the business journals of any other country on the globe. The American business man, manufacturer, wholesaler or retailer, is presented each month with a veritable encyclopedia of information in his chosen field. To the schools of America, and the daily press, as instruments of democratic education must be added our business press with its specialized service.

---

*Consider these features of well-conducted business papers,  
and their influence on the development of business technique:*

---

~ ~ ~ **N**EWs which, in the business paper, means the presentation of all angles of controversial matters; the rapid dissemination of information about new or improved products; the spread of knowledge concerning shifts in personnel in an industry, so important to all concerned; the exhaustive studies of conditions and trends which show in what directions industry is moving; the co-relation of specific developments

in an industry with general movements in business; the technical information which, in any one issue of a competent business paper, might amount to as much as an individual could hope to gather in a lifetime; and over and above all this detailed material is the editorial comment, sifting, comparing, commenting, searching out the basic elements, organizing the mass of news and information into compact, usable generalizations.

The American Business Paper is one of the evidences of America's willingness to learn. Like its widespread system of democratic education, the Business Paper serves an industry's need for impartial information, placing at each reader's command the same accumulation of data, for such use as he may make of it.

# True Talks

with successful sheet metal men

SERIES No. 3

NUMBER 4

## CANADA'S MAIL SORTED WITH AID OF MONEL METAL EQUIPMENT

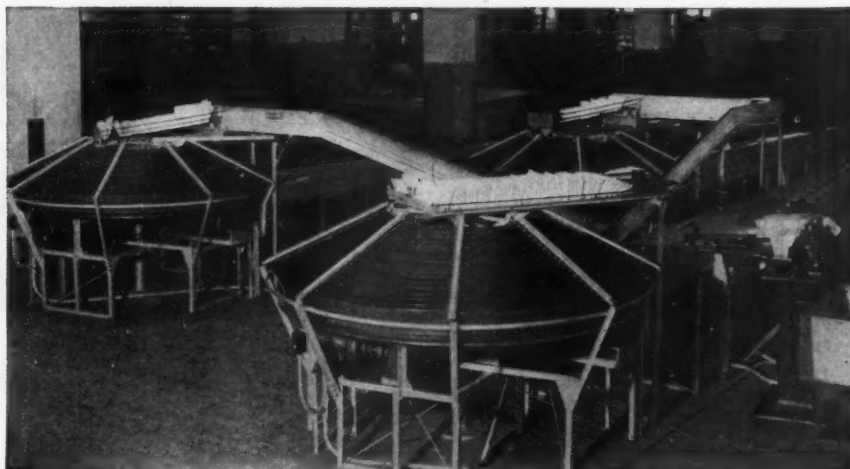
### CANDY MANUFACTURER ALSO PROTECTS PRODUCT WITH MONEL METAL

Mr. Mahaffy is President of Mahaffy Iron Works, Ltd., Toronto. When this concern starts on a job, Mr. Mahaffy *thinks out* what the equipment is going to be up against...and if you know as much about Monel Metal as he does you won't be surprised at how often he chooses it as the best material for the job in hand.



F. G. MAHAFFY  
President and Manager  
of the Mahaffy Iron  
Works, Ltd., Toronto,  
Ontario, Canada.

For instance, glance at those things in the top photo which look like football bowls turned inside out. In case you don't recognize them they're letter-sorting machines. That's the



A letter sorting machine used by the Post Office Department in Montreal and Toronto, Canada. The sorting sections made of Monel Metal. Fabricated and installed by the Mahaffy Iron Works, Limited, Toronto, Ontario, Canada.



Monel Metal spiral chute used by a well known candy manufacturer. Manufactured and installed by Mahaffy Iron Works, Limited, Toronto, Ontario, Canada.

kind they use in Postoffices in Toronto and Montreal, and very efficient they are too. Those circular metal divisions are Monel Metal. Why? Because letters are light in weight and sensitive to friction. So the metal must be smooth as glass, tough and hard wearing as steel; it mustn't get rough with use and it mustn't rust or corrode from the moisture of sorting-men's hands.

So there were no two ways about it...Monel Metal was what they needed, because its shiny surface gets smoother and smoother the longer it is used, its strength is the strength of steel and there's practically nothing that can stain, corrode or tarnish it.

It was much the same story with the spiral chute installed in a famous candy factory. For although there was no human handling to consider, candy equipment must of course be kept spotless...and the owners of this Monel Metal chute told Mr. Mahaffy that it is one of their easiest pieces of equipment to keep clean. Today, after four years of heavy use, they find it more satisfactory than on the day that it was installed.

Jobs like these do credit to the concern that turns them out...and they are nice profitable contracts, too. No wonder Mr. Mahaffy is quite a Monel Metal fan. "We

have also used Monel Metal" he writes, "for sanitary tables and other equipment used by Packing Houses and Abattoirs. It is always a pleasure to use Monel Metal for it makes only articles of quality that we are proud to produce. In fabricating it we have always found it easy to work, whether it be machining, drilling, riveting, welding or forming on a brake."

Mr. Mahaffy is proud of these jobs so he goes right on after more and more Monel Metal work...and gets it, too! You ought to keep well posted on Monel Metal. Write and ask us for literature telling all about the sales opportunities it offers you. We'll tell you about the special sales-literature we have prepared for your use as well.



Sheet metal shop of the Mahaffy Iron Works, Limited,  
Toronto, Ontario, Canada.

Monel Metal is a registered trade-mark applied to an alloy containing approximately two-thirds Nickel and one-third copper. Monel Metal is mined, smelted, refined, rolled and marketed solely by International Nickel.

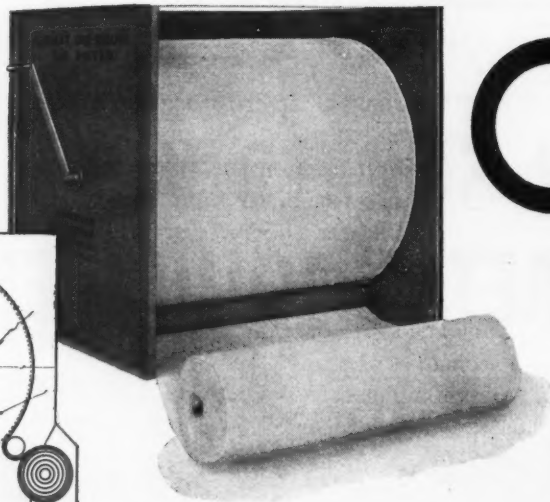
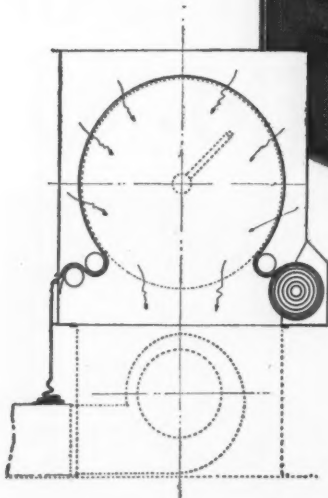


## MONEL METAL

THE INTERNATIONAL NICKEL COMPANY, INC., 67 WALL STREET, NEW YORK, N. Y.

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Side panel removed  
to show filter drum.



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air mat paper in the  
new and novel

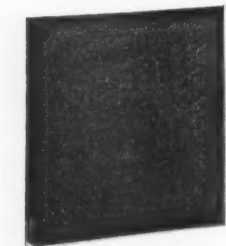
## AIRMAT DRI-DRUM *Automatic Air Filter*

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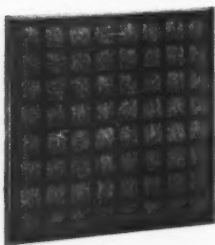
DRI-DRUM is the simplest filter ever offered for home use—simple to install, simple to maintain, simple to operate. Yet it insures *maximum* air cleaning efficiency at all times and under all conditions. The Airmat paper is furnished in continuous rolls of 150 linear feet. One roll is usually ample for a full heating season, even under extreme conditions.

You can always be up to the minute if you're posted on American Air Filters. "Profits from Clean Air" covering full line free on request.

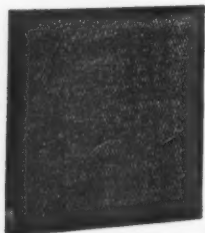
*...American Engineers Lead the Field...*



RE-NU—An all-metal renewable type furnace filter. Only the filter pad replaced.



THROWAY—The filter pad is in a cardboard container. Throw the whole unit away when used.



REED E-Z KLEEN—a permanent filter of the reconditioned type. Just what its name implies

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**113 Central Avenue**

**Louisville, Kentucky**

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## Industrial Recovery

### Industrial Recovery Act

Naturally, we are all anxious to know how the recently passed National Industrial Recovery Act will affect us and to learn what changes will have to

be made in our methods of doing business.

Actually, no one knows today exactly how this tremendously important piece of legislation will affect the operating contractor.

For the manufacturer and the jobber the path is quite well posted. The basic purpose of the bill is to raise wages and prices in order that men shall go back to work. Practically these purposes take the form of federal supervision over hours of labor with the general aim to reduce the hours per week for labor; preparation of codes to insure profitable operation within industries; raising of prices; elimination of unfair tactics and firms; and, where necessary, licensing of operators to insure cooperation.

For the contractor who resells his labor and materials as a retailer, fabricates work as a manufacturer, and competes in a field where price establishment per unit of material or labor is unknown, the future course to be followed has not yet been defined.

Contractors can only wait until the meaning of the law has been clarified and the place of the contractor established. This does not mean that contractors must sit still until someone tells them what to do.

Undoubtedly one of the difficult problems is that of establishing fair and uniform rates of pay for mechanics. Contrary to popular conception the law does not intend that there shall be a uniform pay rate for all the country, but that geographical rates shall be established. The purpose is to set up standard rates of pay for local sections and not for the industry as a whole.

Another important problem upon which preliminary work can be done is the establishment of a percentage of profit and overhead any particular type of job shall carry. It is in profit and overhead that much of the price cutting which is so detrimental is to be found. Many contractors truthfully do not know how much profit and overhead to add, or even what their overhead is. Other contractors willfully cut profit in order to get work and it is this class of operation that the new bill seeks to minimize by governmental control.

Just how these major problems will be worked out is as yet uncertain, but we should remember that this new law has real teeth in it and that if the government really means to enforce its new rights someone is going to suffer unless we cooperate. We should

also remember that under the new law your competitor will be the governmental watchdog over your operations and that one slip may result in serious trouble.

Much must be done to iron out local problems. Where there are local associations these organizations offer the best clearing house for discussion and codification. Where no local organization exists groups of contractors must meet to work out their plans. If our associations or if groups refuse to do any work then we may expect to see communities operated under codes and rates established by groups from other communities.

Each community should be interested in making its voice heard in framing the provisions under which we will operate.

### Business Reviving

♦ We were told after the bear market collapsed that the collapse was plainly indicated by unmistakable signals which we were too hightly-tightly to recognize.

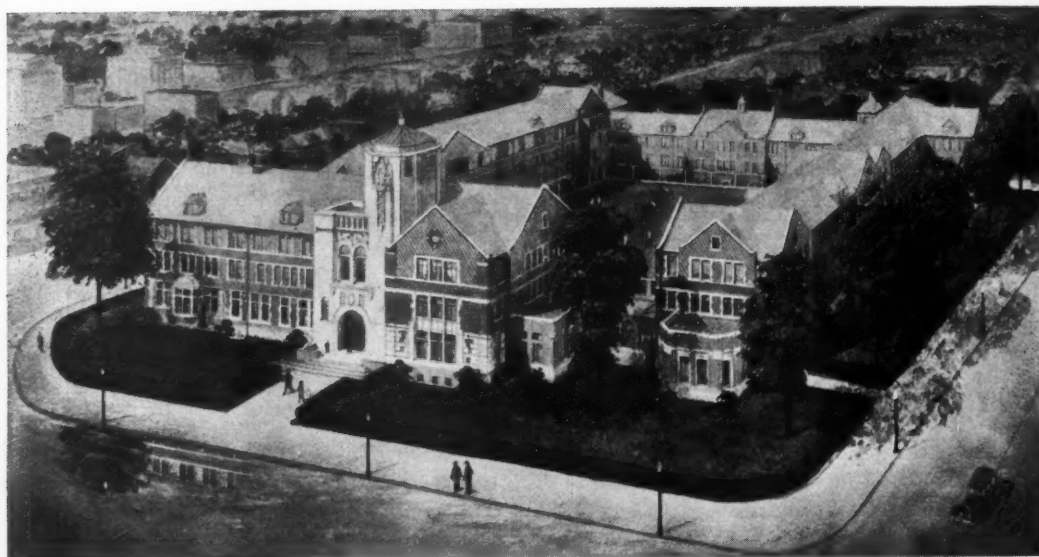
These signals, we were told, were the fall in basic commodity prices many months before the true collapse, an artificial stimulation of prices and sales without a sound foundation, a feeling of nervousness on the part of buyers, and such indications. From this it may be judged that some people had a premonition of trouble many months before the real difficulties developed.

If this assumption is true then we may now be entering the first stage of the recovery without realizing that conditions are better.

Undoubtedly there is a decided note of optimism now evident. Contractors report jobs starting up, inquiries from prospects, jobs brought out for bidding, renewed interest in replacement and repair work, and so on. Without actually knowing it, these signs may mean that we have turned the corner. The serious problem is to determine whether these signs indicate artificial stimulation or whether there is basic improvement.

As one contractor recently stated—"I heard business was picking up, but I was afraid to believe it. Then I determined to get out and see if there was any basis for optimism. Believe it or not, I am now doing work on at least one heating job every day, whereas three months ago I was afraid to come down in the morning because there wasn't even a telephone call to make."

A canvass of your prospects and your operating area may be the wise thing to do right now.



## Metal Drainage and Ornamentation

THERE was completed in Cleveland, Ohio, late last year a quadrangle of buildings known as the County Welfare Group or Juvenile Courts Buildings which locally are considered one of the outstanding architectural and building projects of the city. This handsome group of buildings are faithfully English in architectural composition with all the attention

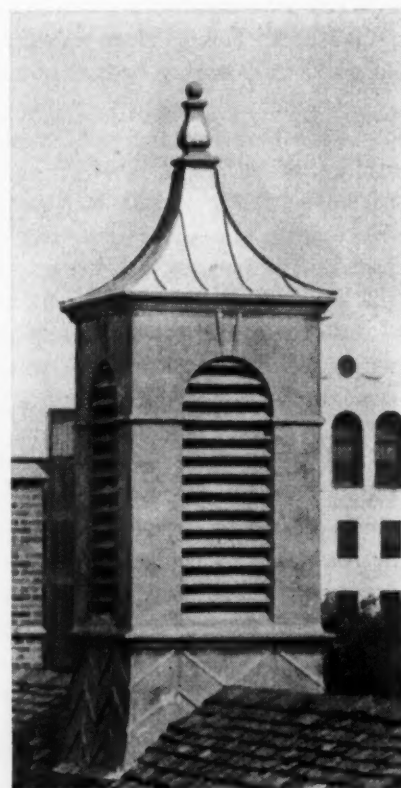
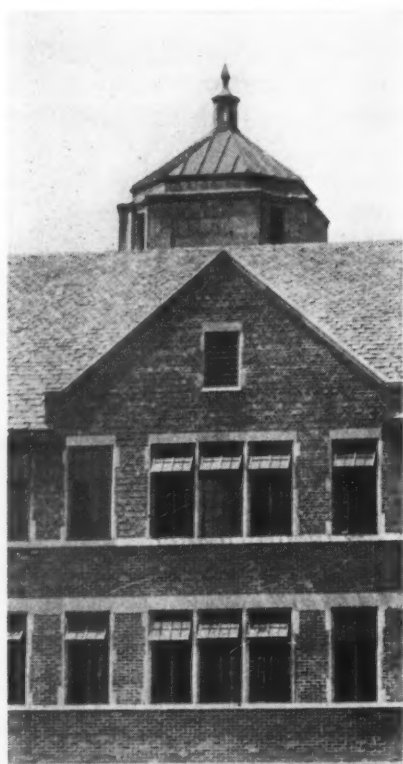
to detail typical of this period of architecture.

Construction throughout is of a high order, the contrasting stone, brick and timber forming a suitable housing for the unusually handsome interior design and construction. As in all pure English architecture, the sheet metal application constitutes a highly important part of the exterior work. Tower roofs, lanterns, conductor heads and downspouts, marquise, canopies and decks not only enhance the appearance, but are functional parts of the protective and drainage system and not purely ornamental.

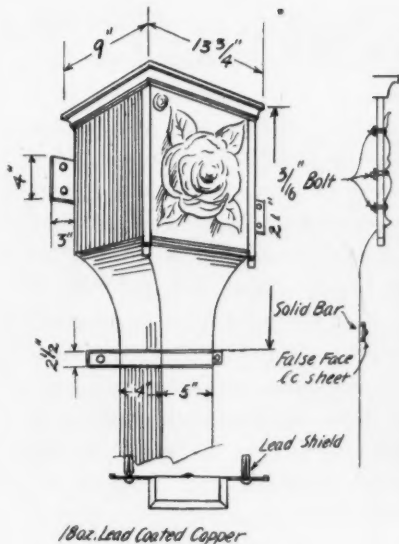
The materials used throughout the group are lead coated copper and sheet lead with a large quantity of heavy gauge metal used for framing. An interesting feature of the project is the fact that every piece of metal used on the buildings was fabricated and hung by the sheet metal contractor in his shop

with the single exception of the ornamental straps which are used on the dormers. These straps were stamped from special designs worked out by the architects and the sheet metal contractor.

The sheet metal contractor who fabricated and installed this copper and lead job is the F. Appleton & Co., Cleveland, Ohio.



The tower at the left and the lantern at the right are copper sheathed in sections fabricated in the Appleton shop and erected on heavy gauge framing also handled by the sheet metal contractor. Construction is explained in the text



### Gutters and Downspouts

As stated, the drainage system really drains with conductors located at frequent intervals along all building faces and on both the outside and inside walls. Each conductor collects from large gutter sections and discharges through downspouts rectangular in form and contoured to all the moldings, bench courses and other wall formations.

In form, all gutters used are identical in size and are shaped and fabricated as shown in one of the details. The girth of the gutter is 30 inches with a  $\frac{3}{4}$  by  $\frac{1}{8}$ -inch brass angle placed in the bead for stiffening. At 24-inch intervals the gutter is supported by  $\frac{1}{4}$  by  $1\frac{1}{4}$ -

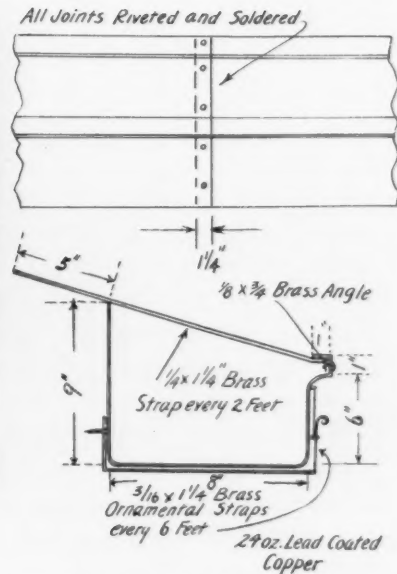


Gutters, heads and downspouts are both artistic and serviceable. This photo and the drawings show details of the design and fabrication

inch brass hangers which are brought out from under the heavy slate roof and soldered to the inside of the outside face of the gutter.

At 6-foot intervals an ornamental bracket carrying a scroll ornament is used on the outside and under side of the gutter. For the four buildings of the group, some 1,500 linear feet of this gutter were fabricated and hung by the Appleton Company. In all cases the gutter was formed from 24-ounce copper, lead coated.

All downspouts are rectangular, plain faced and are hung into the walls from the gutter line to the



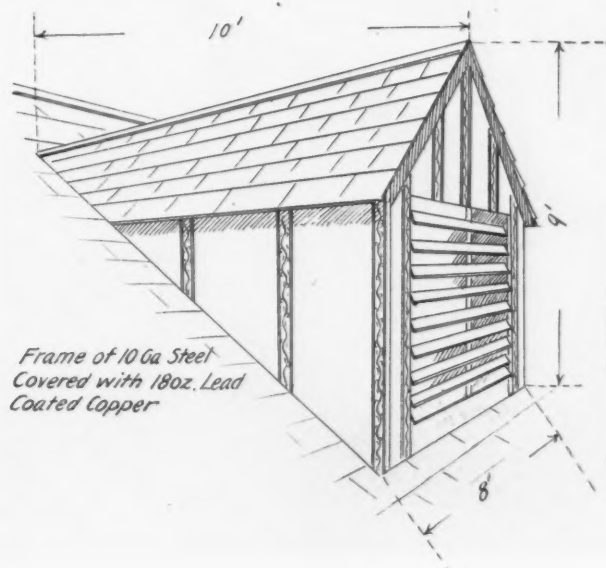
ground level. The downspouts are 4 by 5 inches in size and were formed from 18-ounce sheet by the contractor.

### Heads and Straps

The ornamental item of the drainage system is the conductor head used on all conductor pipe. Forty-eight heads, all identical in size and makeup were required for the buildings. These heads, while ornamental and of special formation were all formed in the Appleton shop from their own design.

The general makeup of the head is a rectangular box as shown on a detail with dropped front corner pendants and a two-step molding

The dormers are placed on heavy gauge sheet framing. The face and cheeks are locked seam with the seams covered with stamped strips by Friedley-Voshardt. General assembly is indicated in the sketch





around the top. The connection between box and conductor is a flared section made up in four pieces and soldered to the head in the shop.

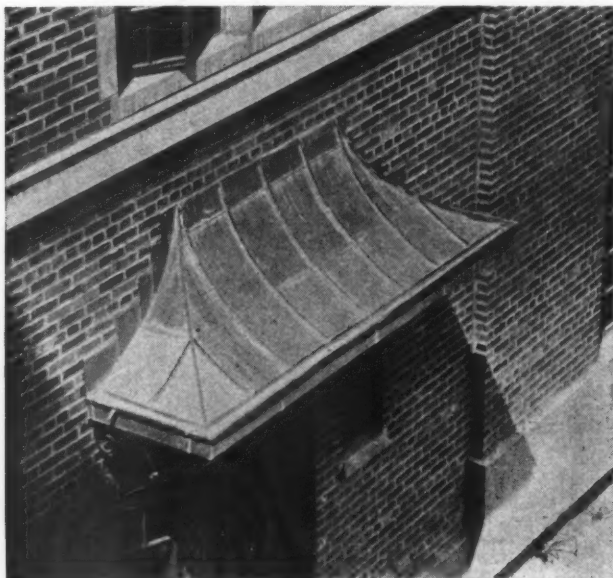
Each head is ornamented by a bunch of grapes or a rosette, the design alternating from head to head on any particular building facade. These ornaments were made with molten lead in the Appleton shop on molds made by a Cleveland plaster mold company. When cast the ornament was screwed to the face sheet and the screw soldered over and smoothed down.

Each head was made in five parts—the face, two sides, the moulding and the back, which carries a holding bracket as shown in a closeup photograph. The head is held to the wall by a heavy strap which carries the bolts. Over the strap a false strap is slipped with pressed out buttons to represent bolt heads.

The conductor straps are formed in the same way.

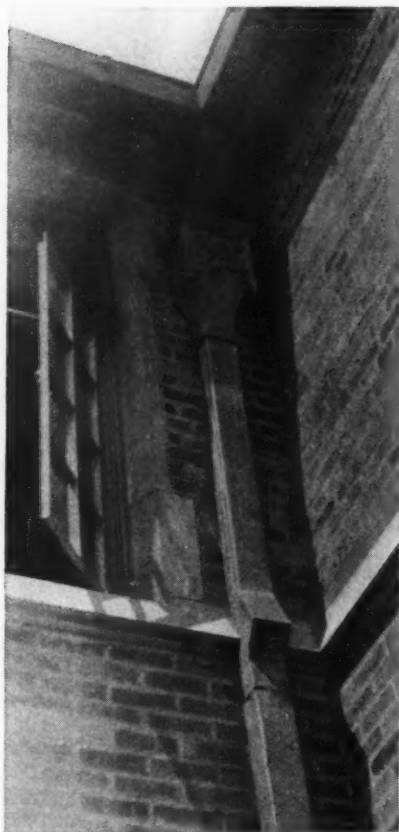
#### Tower and Lantern

Two ornamental units are used above the ridge level. Over the main entrance the masonry tower is topped with a low pitched metal roof and metal clad lantern. Directly opposite, on the other building, is a metal sheathed lantern as shown in one of the photographs.



Above is a close-up of a gutter and head showing design, hanging and contouring to the wall face

Miscellaneous metal details like this marquee, also awnings and canopies are all lead coated copper, patterned after the tower design and erected on wood framing



The roof on the tower is batten type with the pan sheets and batten caps formed in lead coated copper. This small roof is octagonal, with eight hips of a cross section identical with the battens. Each face has pan sheets laid between battens of the cut under, self capping type, each pan sheet carrying a capping edge to form, when completed, a snugly fitted double seam. The sides of the roof are finished off with a molded cornice which forms a drip

and flashing for the masonry wall.

The lantern base which straddles the roof ridge is ornamented with chevrons formed as a part of the base face sheet. To secure this formation each side of the base is composed of four face sheets in which a diagonal chevron is formed on the brake. When the base is put together these formations meet end to end to form the chevron shown.

The lantern opposite the main tower is really a ventilating tower with each face carrying a lead coated louvre section. In construction, the Appleton company had to provide the structural frame of these lanterns which accounts for the 10-gauge sheet used on the job. This heavy sheet frame was covered by the louvre sections which were put together in the shop and the four faces joined on the roof.

Above the louvres there is a bell-cast batten roof similar in construction to the tower roof and topped with a square vase and ball finial.

#### The Dormers

One of the details using considerable metal is the group of 22 dormers which break both inside and outside faces of the roofs of all four buildings. These dormers are used for light and also as louvred outlets for the ventilation system. The design is, generally speaking, rather plain. The face and the cheeks are covered with plain sheet, locked, with each seam covered by the ornamental strips previously referred to. A rather simple molding is used along the cheeks and is carried into the pediment as a plain section.

#### Miscellaneous Metal

There are a number of additional applications of metal on the building, as for instance, the canopies over some of the small doorways and the marquee over the loading platform and vehicle entranceway.

One of the largest applications of metal is the use of lead under all stone courses throughout the buildings. The lead used was 3½ pound sheet and required 5,000 pounds.

# The National Industrial Recovery Bill

**A**S the difficulties of the depression have developed, it has become more and more clear that many of the major troubles of industry are caused by unorganized minorities. It is out of this fact that the National Recovery Act grows—the act which, as now passed, carries strong medicine for the “chisellers” and the price-cutters in industry, the fringe group which has thrown so many monkey wrenches into the machinery of distribution.

Never before has the trade association been presented with such an opportunity to put its house in order, as it will have under the National Recovery Bill. Those abuses which have crept into every branch of industry and which have made it impossible for the man conducting a business on sound lines to compete, unless he wanted to give jobs away, can now be brought under control if associations recognize their opportunity and act upon it.

## Industry May Make Code

Here is a brief summary of what the bill provides, issued by Senator Wagner who was chairman of the committee which framed the measure:

“The principal and immediate object of this bill is to open opportunities for the employment of several million men and women, and thus distribute purchasing power which will be effective in starting again the wheels of industry.

“The purpose of Title I of the bill (dealing with industrial recovery) is to secure co-operative action within industry with a view to eliminating unfair competitive practices and thereby to reduce unemployment, improve standards of labor and otherwise to rehabilitate industry.

“The bill authorizes any group or association within a trade or industry to prepare a code of fair competition which sets forth the standards covering trade and competitive practices within that industry. Such a code is without effect until it is approved by the President.

## Code Provisions

“The President may approve such a code if he finds:

“First. That the group presenting the code truly represents the trade or industry for which it speaks.

“Second. That it admits freely to membership all who are engaged in the same trade or industry.

“Third. That the code of rules is fair to competitors, employees and consumers.

“Fourth. That it will not promote a monopoly.

“Fifth. That it does not oppress or discriminate against small business enterprises.

“Furthermore, the President is authorized to enter into or approve agreements relating to any trade or industry with a view to improving conditions within that industry and increasing its power to provide employment.

“The initiative is left with industry. However, should an industry be unable or refuse to co-operate, the President may impose upon it a code of fair competition and in extraordinary circumstances license the trade or industry. Once a code of fair competition is approved or issued by the President, it becomes the standard of fair competition within that trade or industry to which it applies, and all those who comply with it are exempt from the provisions of the anti-

trust laws, and all those who violate it are subject to legal penalties.”

B. F. John of Philadelphia has written to say that the various national associations which have local organizations in Philadelphia “are now working in committees with other locals to find a fair sales price, and trying to decide how to approach the entire subject for the quickest results, or whether the matter should be approached from the national first and then followed by each local or the reverse.

It seems to us that here is a real association assignment, indeed. What better for an association existence; what larger or more important a task for any association than this opportunity for our associations to stamp out unfair competition, put men to work, raise our standard of prices and wages and start our industry back along the road to profit?

We would raise the further point that the time for associations to act is now. It is always possible to make more progress when men have been forced to recognize the true state of affairs. No sensible member of any industry—certainly any industry that is a part of the building field—can deny that there are abuses that have been crying for correction for a long time. Now is the time to get to work on them. The attitude at Washington is favorable to co-operative action in view of the need for overhauling the whole commercial machine of the country.

Trade association officials who recognize their opportunity, and who show the capability required to draw up the new “bill of rights” for their industries, will win an enviable place for themselves, which is important to them. What will be more important to their industries will be the restoration of conditions under which sound business men may operate sound businesses—at a profit.

# Automatic Controls

We discuss here a control hookup with the room thermostat controlling the fire and a fan switch controlling the blower. No limit control is used. This article points out the advantages and disadvantages of this system. In addition, some of the general problems of control are outlined.

**W**E outlined in the June issue some of the early history of controls as applied to forced air heating. We also pointed out some of the problems which have to be solved in designing and applying controls to heating systems.

Before we discuss a particular hookup let us stop for a minute and consider exactly what it is we hope to do with any control system. We must remember that controls are not "cure-alls" for heating systems which are not properly designed, engineered, installed and balanced, but they can only make a system function within the limits of the installation and cannot do the impossible.

In connection with the June article, we showed two wiring diagrams which were designated as the earliest type of hookup. This statement was incorrect in as much as the controls shown are of recent development and were not used on the first forms of hookup.

Therefore, in this article we will go back to the control system which operates as follows—a room thermostat follows the rise and fall in room temperatures. This room thermostat opens the draft and closes the check when heat is needed and keeps the draft open until the room thermostat is satisfied. The fan is controlled by a thermostat placed in the furnace bonnet and set to deliver air of a temperature just sufficient for the designed register air temperature of the heating system. With this control the fan may turn on or off while the draft remains open but will always continue to run after the draft is closed.

In this system no furnace limiting control is used.

It is important to note here a fact which was brought out emphatically by manufacturers, engineers, contractors, research men who cooperated in gathering information for this series, namely—that the installer of a control system should try to know all about the factors which will influence the operation of the system after the job is turned over to the owner.

For instance, control systems designed for hard coal may not be equally satisfactory on other coals or coke where heat is generated in enormous quantities, in short periods. Further, a system which is satisfactory on good draft may be sluggish, or unsatisfactory, in a house where there is little draft for the furnace.

And again, house construction and exposure are important because a poorly constructed house where heat loss is high and rapid requires a control system which responds immediately so that the house shall not get "cold."

♦ ♦

**In the caption on page 14 of the June issue we said that the control system shown did not give control over room temperature over-run. That statement was incorrect because the equipment pictured does have a limit control. This limit control, when correctly set, reduces or prevents room temperature over-run.**

♦ ♦

It is quite true that these factors are primarily functions of correct design of the heating plant proper, but in speaking of controls we are assuming that the furnace system is adequate, is correctly engineered and that, therefore, it is up to the control system to make this correctly designed system function satisfactorily.

In brief, then, a control system seeks to do the following:

1. Maintain uniform and constant room temperatures throughout the house during all outside weather conditions.

2. Control the fire so that heat will not be wasted, maintain as uniform a combustion rate as possible just sufficient for the needs of the house and the weather.

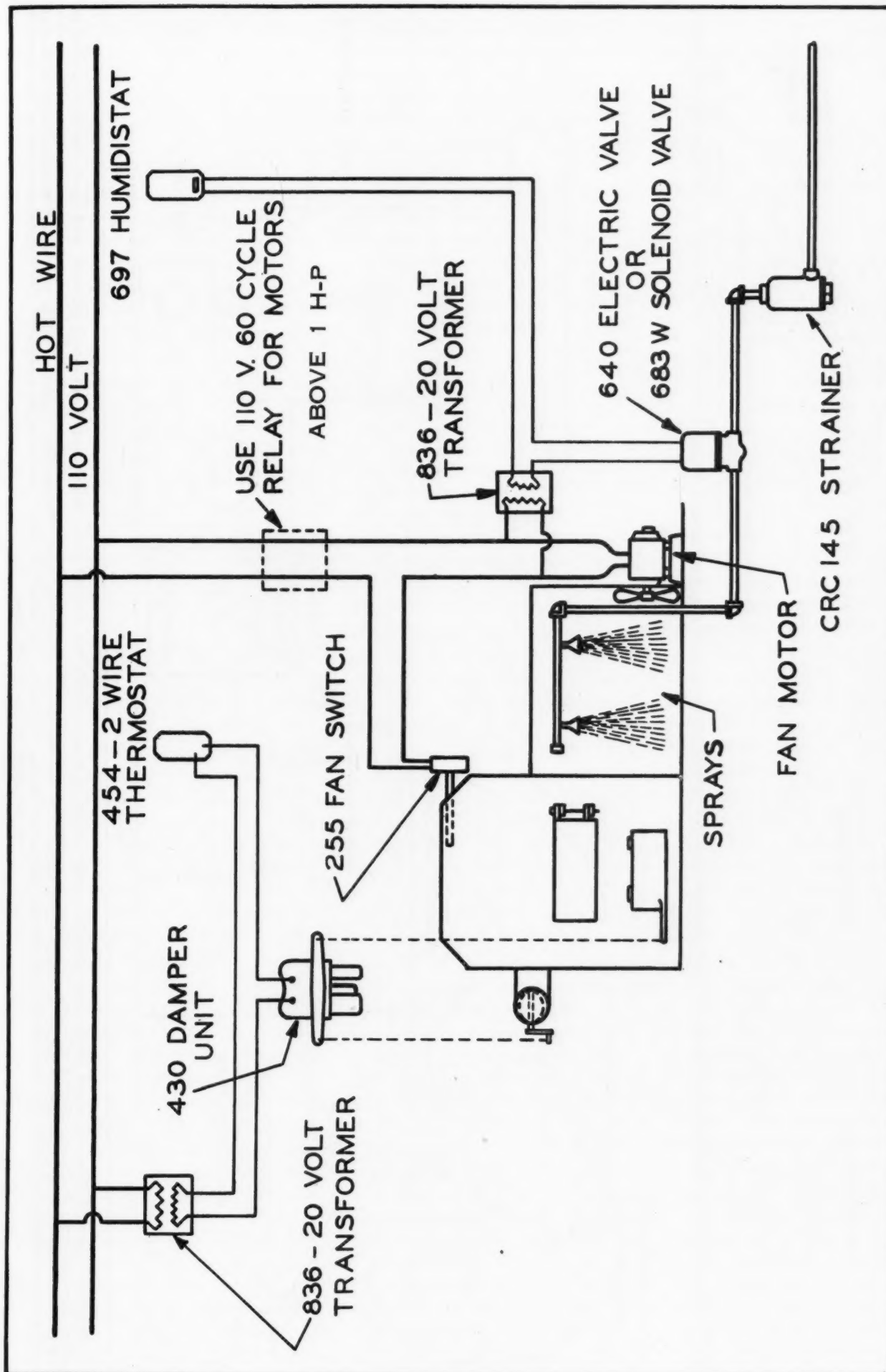
3. Meet any sudden demands due to changed outside conditions or owner's wishes.

4. Be dependable, simple, safe, and require a minimum of adjustment by the owner and service by the contractor.

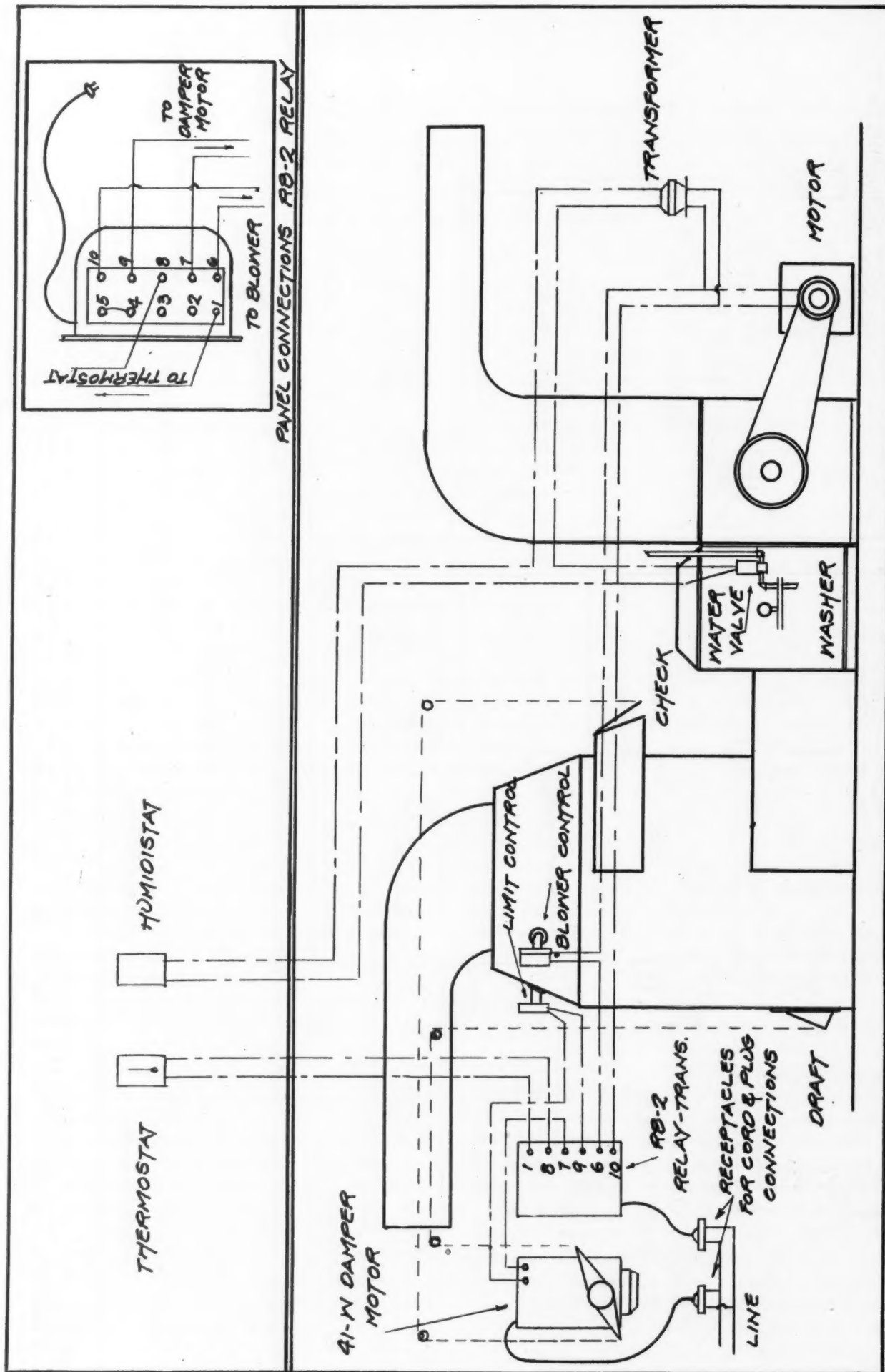
Taking up in detail the requirements which any control system must fulfill we find under requirement number 1 that the chief difficulty of this particular hookup is encountered in keeping the room thermostat from being over-run by the heat supply.

Under this control system when the room thermostat calls for heat the draft is opened and remains open until the room thermostat is satisfied. During this period the fan may come on and go off several times, but in all cases the fan continues to blow warm air into the rooms after the room thermostat is satisfied because the fan continues to run until the bonnet temperature





Above is shown a wiring diagram in which the room thermostat controls the fire through the draft and check, a bonnet switch starts and stops the fan. The fan continues to run as long as there is heat in the bonnet often resulting in over-run of the room temperature. No limit control is used so when the draft is open for a long period the fire may reach a run-away condition. There may also be a lag in room temperature pickup when the draft has been closed for a long period. The humidity control is positive because the spray is controlled by a humidistat and can only operate when the fan is running. On current failure the fire is checked. This is probably the simplest form of control, but is not strictly up to date in its operation. All units shown in this diagram are products of the Detroit Lubricator Co.



In the system pictured above the room thermostat controls a relay which, in turn, controls the damper motor which opens and closes the draft and check. A limit control is hooked in series with the motor so that whenever the bonnet temperature rises above the high setting of the limit switch the draft is closed regardless of the room thermostat. The fan switch is in series in the blower circuit so the fan cannot start if the bonnet temperature is too low. The blower is shut-off when the room thermostat is satisfied, preventing room temperature over-run. The washer can operate only when the fan is running and when the humidistat calls for moisture. The instruments used in this diagram are all made by the H. M. Sheer Co.

falls below the low setting of the bonnet blower control.

To illustrate, let us assume that the room thermostat is set for 72 degrees. When the room temperature falls below 72 degrees the draft is opened and the fire begins to pick up. When the temperature of the bonnet reaches the high setting of the fan thermostat the fan starts. As we pointed out in the first article this setting of the fan thermostat may vary from 110 degrees to 250 degrees according to the choice of the contractor.

Specifically, if the high setting of the thermostat is 175 degrees the fan starts when this 175 degree temperature is reached in the bonnet. The blower may quickly exhaust the heated air in the bonnet so the fan shuts off. But the draft remains open because the room thermostat is not satisfied and soon the bonnet temperature again reaches 175 degrees. Again the fan starts. This cycle of "on" and "off" periods of the fan may be rapid and continuous, depending upon the regenerative capacity of the furnace and the capacity of the fan.

In this cycle the controlling factor in the length of "on" cycle of the fan is the low setting of the bonnet blower control rather than the high setting, for if the low setting is really low the fan can continue to run until a temperature of perhaps 100 to 125 degrees is reached before it shuts off. If the furnace is of ample capacity and the fire is clean and responsive, a wide range in the settings permits the furnace to keep up with the fan and gives more constant fan operation.

When the room thermostat is satisfied the draft is closed. However, when the draft closes the furnace is generating heat at its maximum capacity so the bonnet temperature is high and the fan continues to run. As the fan continues the heat is withdrawn and the fan shuts down. But the furnace is still generating heat so the fan comes on again and these "on" and "off" operations of the fan may continue through several cycles

after the draft is closed and the room thermostat satisfied.

It is this fan operation after the draft is closed which causes the over-run of the room thermostat.

Remember, in the system we are talking about there is no limiting control used.

Additional difficulty is frequently encountered with this hookup in selecting just the right settings to synchronize the operation with outside weather conditions.

To be specific, let us assume a house of ordinary construction and outside weather of plus 30 degrees with a 15-mile wind. The heat loss will be comparatively slow and the "on" cycles of the furnace and fan infrequent. If the fan settings are high in mild weather the furnace generates much heat before the fan comes on. After the room thermostat is satisfied there is still residue heat which over-runs the thermostat. To eliminate this condition a lower pair of settings or a closer setting between high and low would probably be most satisfactory.

As a contrast, let us consider a day with outside temperature of zero and a 30-mile wind. The heat loss will be high and rapid. The room thermostat will probably demand heat at frequent intervals. The draft opens every time the room thermostat calls for heat and may remain open for long periods. Under these conditions, higher fan settings would probably be preferred.

Actually, however, it is difficult to change settings for outside weather unless the owner is willing and able to cooperate. The best solution is probably to set the "low" fan setting as low as permissible and if changing is done confine the changes to the "high" setting raising the temperature in cold weather and lowering it in mild weather. This increases the fan "on" range, which is desirable, and reduces the number of changes to be made on the control unit.

On point 2, economy of fuel consumption depends largely on whether or not the maximum output of the furnace can be handled

by the fan and furnace or whether much of the heat generated is wasted up the chimney. If flue gas temperature readings are taken on control systems of this type it is usually found that the flue gas temperature ranges from 100 degrees to 400 degrees in mild weather and from 250 degrees to above 600 degrees in severe weather.

Obviously, most furnace-fan systems cannot efficiently accommodate all these ranges in temperature, hence during some temperature ranges more heat is generated than the system can take care of. This constitutes a fuel waste. Tests indicate that in the hookup under discussion periods of excessive flue gas temperatures occur, indicating that part of the heat output may be wasted. This waste of heat constitutes one of the disadvantages of this control system.

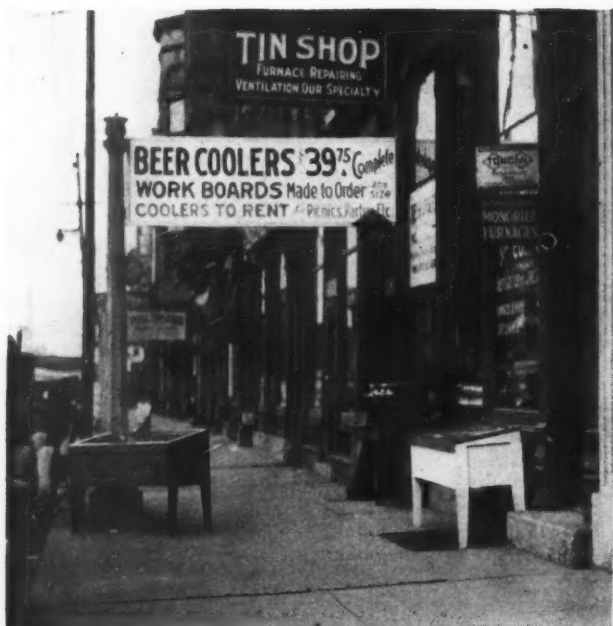
If a control system meets the second requirement of point 2—just sufficient heat generation to meet requirements, then this system probably does not rate very high because periods of excessive flue gas temperatures usually indicate periods when more heat than needed is being generated.

So far as ability to meet sudden demands (point 3) this hookup depends more on the fan settings than on the hookup proper—the lower the settings the quicker the fan responds—but in general the hookup does not actually meet the definition of ability to meet sudden demands.

The advantages of this hookup are simplicity in wiring, few instruments needed, and few complications in setting. House temperatures are fair, but will probably be over-run unless settings are synchronized with outside conditions. Bonnet temperatures can be restricted within narrow limits due to the settings of the fan control.

Generally speaking, this commonest type of control is only fair in overall satisfaction. A modification of this hookup, whereby some of the faults are ironed out by inserting a limit control, will be discussed in the August issue.





## 25 Beer Coolers, 12 Work Boards a Week is Sales Record of Columbia S. M. Co., Chicago

**T**HE Columbia Sheet Metal Company, Chicago, is one firm which has unquestionably found the revived beer business a field furnishing steady operation and sizable profits.

This firm has, since beer "came back," sold an average of 25 beer coolers and 12 work tables a week and there is no let up in sight.

This remarkable sales record is all the more interesting because the firm has not heretofore specialized in service equipment and the sales have been made without the use of expensive advertising or complicated selling methods.

When beer seemed imminent Jack Weiner of the firm prepared some designs for a line of coolers in one, two and three faucet sizes and a line of work tables having a washing sink, drain board and with and without a bottle storage compartment. Some additional items such as one-faucet picnic boxes, special work tables and small one faucet counter coolers have also been developed to meet requests as they came up.

The units are being manufactured in copper, stainless steel, nickel copper as standard lines and will be fabricated of any other metal on special order. An interesting fact is the establishment of a price list per foot of length for the work tables. This price list shows \$5.00 per foot of length for polished copper, \$3.00 per foot for galvanized iron

and \$8.00 per foot for stainless steel. This standardized line consists of a combination drain board and washing sink as shown on one of the photographs assembled on a standard wood frame.

"The first orders received," says Jack Weiner, "came from store fixture companies we had contacted and shown samples of our line. When beer really came back these fixture companies found themselves swamped with orders for the lower priced units and could not fill their orders from the stocks of the regular equipment manufacturers.

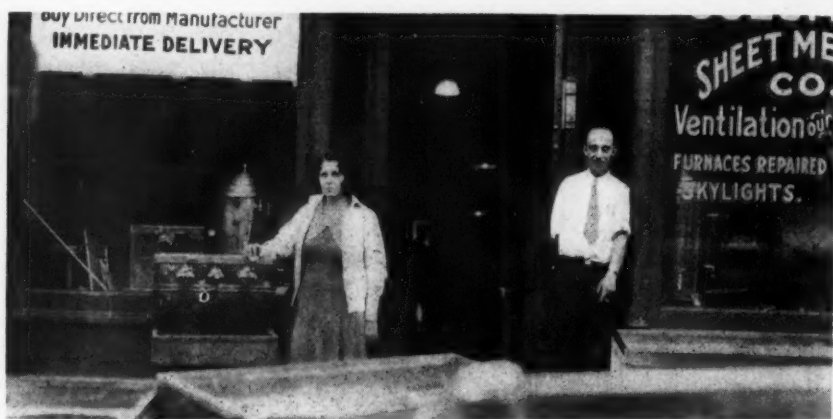
"It was also discovered that buyers were very much interested in a line of low priced units because they did not know how much license fee, tax, and so forth an establishment would have to pay and few dispensers felt like investing several thou-

sand or even several hundreds of dollars in equipment which they might have to give up.

"The line we had developed seemed to fit the demand nicely and for weeks we worked two shifts in the shop and have sold more units up to date than we can fabricate.

"Of course, considerable business is now coming from other sources than the fixture stores. Purchasers of the first units recommended our line to persons opening up taverns and these purchasers, in turn, sent us other buyers. We have also solicited work from prospective sales agencies and we expect to get additional business from old customers who have prospered and need larger or more elaborate equipment.

"A new law passed in Chicago a few weeks ago requires that all new bars and work tables have a hot



Jack Weiner, owner, and Miss E. Keene, secretary, Columbia Sheet Metal Co., in front of the display windows. Above is shown the sign and display units in front of the shop. Mr. Weiner says that Miss Keene is a real beer cooler saleslady.

and cold water washing compartment in place of the single well we placed in the first bars and tables. This requires some alterations in the units and adds slightly to the cost.

"We are not sure as yet how license fees will effect this activity, but there, probably will be two classes of buyers. One class will select the elaborate and expensive equipment while the other will require inexpensive units. So far as we are concerned, this latter class offers the best opportunities for our facilities. We believe that there will be plenty of work in this field for the shop which can make substantial, low priced units."

The photographs show the principle features of the units now manufactured by the Columbia company. Both the cooler and the work table are built up on wood frames. For the copper and galvanized iron units a white pine frame, mostly of 1-inch lumber is used. For the

ered with a full wood top over which the metal is turned down and fastened along the edges.

Experimentation developed the fact that many low priced work tables do not provide a bottom support for the sink. This proved a serious handicap with copper because rough usage dents and eventually breaks the sink bottom. On all

Particular attention has been paid to insulation. One-inch cork is used, cut and placed to seal all joints and insure good retention of the cold from water and ice.

All cooler liners and in all sinks tinned copper only is used. This insures a more lasting metal surface.

A line of combination work ta-



Above is a work board in copper with a double lidded bottle compartment and behind the work board are shown two one-faucet coolers. At the left is the shop force standing behind a work table with two small coolers and a standard three faucet cooler. In the foreground are a copper and a galvanized iron work board.



stainless steel units a red wood frame is used so that a rich mahogany finish can be applied.

The frames have been experimented with to get a frame which will be substantial, solid and free from weaving and looseness. The legs or end pieces are fastened to the bed in a full lap to prevent distortion. The bed, in turn, is built up with reinforced corners and cov-

Columbia sinks a supporting wood bottom is used to eliminate this.

All drain surfaces are corrugated and sloped to the sink for drainage and a four sided apron or raised edge is used around the outside.

Standard coolers have 35 feet of block tin coil, but longer coils are furnished upon specification. The coil is  $\frac{3}{8}$ -inch, five-ounce tin. The water faucet has 15 feet of coil.

bles and bottle coolers has been developed in both left and right hand units. On these units three types of bottle containers are provided—double lidded, holed lids and compartments without lids. The purchaser may have any one of the three styles.

The company early discovered a demand for small sized units. To meet this demand a counter type, one-faucet cooler in copper or stainless steel was developed. This is the unit which is priced on the sign outside at \$39.75. The company also has a stock of picnic coolers in the one-faucet size which are rented out at \$3.50 a day. This price has been determined as adequate to cover breakage and repair, cleaning after use and return a profit on the cost of maintaining

(Continued on page 26)

# Sylvander of Red Wing, Minn., Puts on Cleaning Drive Which Nets 240 Furnace Jobs

Closely-knit campaign of six pieces of literature pulls good results at a small cost.

THIS is the story of a man, young in years, and young in the business, who worked out a furnace cleaning program that netted splendid results.

"This is my second year in business," he says, "and am 24 years old, so I have not had very much sales experience, but I think you should advertise at least once a month, for advertising pays."

It does—especially when a campaign is as closely-knit as the one N. B. Sylvander of Red Wing, Minn., carried on. Let's first take a look at the advertising material he used in this effort, and the way he used it. The first thing he did was to make a survey of every furnace in Red Wing. When his canvassers made this check-up, they tacked up the card which is marked No. 1. At the same time the canvasser filled out the card, No. 2, on which

No. 1

**FURNACE REPAIRING  
CLEANED RECEMENTED  
24 HOUR SERVICE**

**Parts For All Makes  
Of Furnaces**

When you need parts for this furnace or a smoke pipe, I have the number of furnace, size and length of smoke pipe call and I can give you prices over the phone.

Ask about the Weir  
Air conditioning Unit

Also repair gutters, metal roofs and sell all sheet metal products in the building line.

**N. B. Sylvander,**  
Heating Contractor  
449-E-7th-  
Red Wing, - Minn.  
Phone 634-J

**Coupon Good For \$2.00**  
On a Recement and Cleaning Job, if order is given before April first 1933. Work can be done any time before Aug. first. Why not give the order now?  
If Satisfaction or no pay.

Above is the card which was tacked up in every home where the canvassers made a survey of the condition of the furnace. Below is the survey card which the canvassers filled out to show sales possibilities.

No. 2

Name	C. M. Anderson
Address	1020 Startevent St.
Owner	
Make	T. Zone
No.	020
Condition	
Smoke Pipe	2 L. 8 S. 4 Bl.
Installation	
Furnace Cleaned	See for fixing
Needs	radiator
Year Installed	15
Satisfied	
Oil Burner	Humidifier
	Blower

From the 240 cleaning jobs came 162 repair orders, 9 remodelling, 7 humidifiers and 16 new furnaces.

all information necessary to a later call was to appear. Note that, at the bottom of the card, No. 1, which was tacked up in the basement when a survey was made, there is a coupon, good as a credit on a cementing and cleaning job.

This canvassing was done by Mr. Sylvander and one of his men, who was doubly interested in doing a good job, because the more business the firm got, the more work he would have.

Mr. Sylvander made this survey in March of last year. As a result of the canvass and the follow up letter, No. 3, he received 46 cleaning orders.

Then, a few days later, the letter, No. 3, was sent out, with the last two paragraphs left out, and with a return post card enclosed.

Just as soon as the cleaning jobs were started, Mr. Sylvander distributed a handbill, No. 4, which



No. 3.

CUTTERS, SHEET METAL, ROOFING & OIL BURNERS

**N. B. SYLVANDER** Master Carpenter

Phone for 800 Houses of Furnaces  
1000 Commercial Bldg.  
10 West Service

449 E. 7th St. Phone 634-J

RED WING, MINN.

Dear Friend:

You surely want your heating plant cleaned before you clean house this spring. Why not use the coupon I left with you some time ago? It is worth \$2.00 on a cleaning job if the order is given before April 1st. The work can be done any time before August 1st. All cleaning is done with a modern vacuum cleaner and all dirt removed.

A thorough cleaning job consists of the following:

1. Taking off the casing of your furnace and cleaning all hot and cold air pipes. This is the only way to do the work right.
2. Cleaning all registers.
3. Removing soot from bottom of chimney.
4. Taking down the smoke pipe and removing all soot.
5. Cleaning the inside of the furnace, including removal of ashes from grate and ash pit.
6. Painting all exposed casting with rust resisting black paint.
7. Reconnecting smoke pipe and sealing into chimney properly.
8. Placing new paper on furnace wherever needed.
9. Cleaning off top of ducts in basement.

The reason that I can clean your furnace for a reasonable price and do on A-No. 1 job, is that I have no office rent to pay or any other overhead. The work is done by me and local men employed by me. I can take care of the furnace, prolong its life and save you money. I guarantee satisfaction always.

I will call on you tomorrow and give you an estimate and explain the work. I do not require you to sign a contract but if you give me your order now the work will cost you \$2.00 less than the regular price.

If your gutters need repairs why not let me give you an estimate? I am giving 20 per cent off on all work contracted for before April 1, 1933.

Yours for Service,

*N. B. Sylvander*

**LOOK**

**NEVER BEFORE**

Your Furnace Vacuum Cleaned for

**\$1.50**

Will be Cleaning in Your Neighborhood this Week during which time My Prices are as Follows

1. Cleaning Furnace and Smoke pipe \$1.50 You can't afford getting dirty for that price.	4. Chimney only cleaned \$1.50
2. Cleaning Furnace, Smoke Pipe, Chimney, all Hot and Cold Air Ducts, Painting Papering where ever needed in fact Cleaned practically as clean as New for \$5.00 to \$7.00 depend on the number of Ducts.	5. Boilers in homes \$2.50
3. If your Furnace needs reconnecting that will cost only \$2.00 more if work is done when cleaned.	6. Cleaning, checking Oil Burners & 60 extra all Furnaces with Oil Burners should be cleaned once every 3 years.
	7. Cleaning Pipes less Furnace complete \$2.50

Your Furnace should be cleaned every Spring if left uncleaned through out the summer there is a damage caused by Creosote.

Think this over. We will call to morrow if you are figuring on having it done later in the summer or fall, have it done now and pay for it Sept. first.

All cleaning work done with a Modern Vacuum Cleaner. I guarantee Satisfaction always. Work done by me and Red Wing man.

**N B SYLVANDER** PHONE 634-J 449-E-7 ST. RED WING, MINN.  
STEEL FURNACE CO., RED WING, MINN.

FILE When we call to morrow we check over your Furnace and Paint the Front FREE

called attention to the fact that his cleaning crew was working in the neighborhood that week, and quoting the special prices for the various types of jobs he was prepared to do.

In August he sent out a fifth piece of literature—a handbill which is not shown here. This was a piece of straight merchandising copy on the furnace Mr. Sylvander handles. In this copy there is an interesting paragraph under the heading: "Every Job Installed According to Standard Code." The paragraph read as follows: "The Standard Code is no one manufacturer's set of rules. It is the Code of Standards based on scientific research, and adopted by the National Warm Air Heating Association, The American Society of Heating & Ventilating Engineers and The National Association of Sheet Metal Contractors. It is designed to insure adequate heating." On the other side of this handbill was a piece of copy about the oil burner that Mr. Sylvander handles, and a repetition of a special offer on a cleaning job.


Another extremely interesting point was made in this fifth piece of

The letter on the left was sent out after the completion of the canvass. The handbill on the right, above, was distributed just as soon as cleaning jobs were started, to other houses in the neighborhood. Below is the final piece of the campaign, a handbill distributed in October.

No. 6.

**Prevent Fires**

**Save Fuel**



Have your Furnace Cleaned with modern Electrical Vacuum Cleaner.

It is not necessary to have your Fire Out.

Save fuel by having heating surfaces cleaned. The U S Department of Commerce is authority for the statement that no more than an eighth of an inch of soot on the heating surface of a Furnace reduces its efficiency at least 25 per cent.


Any make of Furnace or Boiler cleaned for \$1.25

Cleaned every 30 days during the winter for \$4.00

This job includes Cleaning furnace heating Surface, Smoke pipe and base of Chimney  
No Mess or Fuss

Over 200 Satisfied Customers

**N B SYLVANDER**  
449 E 7th St. Phone 634-J  
RED WING, MINN.



literature, concerning the type of duct work he does. "All ducts," he informed his prospective customers, "are soldered all the way around and enameled. No asbestos paper used to cover up workmanship."

Then, on the first of October the handbill No. 6 was sent around and here are the results of this little campaign: Mr. Sylvander has cleaned 240 furnaces. From this total number of jobs he received 162 repair jobs, of which 9 were complete remodeling jobs, 7 called for the installation of humidifiers and 16 for new furnaces. The expense of printing and distributing the handbills ran to only \$56, a reasonable enough figure, considering the number of jobs secured.

The method of approaching a customer was very simple and direct. The home owner was told that the firm was making a survey of every furnace in the city, and was asked the make and size of their furnace. Nine out of ten people, Mr. Sylvander reports, told them to go into the basement and see for themselves. This year Mr. Sylvander is paying 10% for the canvassing.

# National Warm Air Association Meeting

THE spring meeting of the National Warm Air Heating Association, held June 5, 6 and 7 in Chicago brought announcements of several important developments in the fields of general business and research bearing on particularly acute phases of activity.

Probably one of the most interesting pieces of business transacted was the adoption of an enlarged name for the association. The new name adopted in meeting is National Warm Air Heating and Air Conditioning Association. This new name was chosen after a special committee reported that undercurrents in the air conditioning field were considering the formation of an association devoted strictly to air conditioning and further reported that because of the need to establish our association as the true air conditioning industry a change which would take in this line of activity seemed desirable.

Another important announcement was presented by H. T. Richardson reporting on repair parts. Mr. Richardson announced that a number of manufacturers have gotten together and will bring out a repair parts catalogue which will show all furnace parts under one cover. He declared that the manufacturers co-operating hoped to get all manufacturers interested and listed in this catalogue. As planned at present this catalogue will be mailed to at least 16,000 furnace dealers.

It was moved, seconded and adopted that the December meeting be held in Cincinnati. Definite dates, place of meeting and details of the program will be announced this fall.

## Research Report

The semi-annual report of progress by the Research Residence staff was, as usual, one of the most interesting features of the meeting. In introducing the report Professor Willard outlined briefly the progress of the research activity during the past fifteen years. He emphasized

the point that these tests are not guaranteed nor are they guarantees of any particular finding, but he emphatically declared that the staff believed all tests were impartial, fundamentally correct and fair to both manufacturers and dealers.

Professor Kratz and special research Assistant Konzo reported the progress of tests made since the December, 1932 meeting. These tests are not yet available for publication but an outline of the ground covered can be given. Tests have been made on behavior of three types of furnace bonnets—high bonnet; low, flat bonnet; pitched bonnet and a special arrangement of the latter using an inside baffle under the radiator.

Preliminary tests have been made to compare results obtained with small sized furnaces in warm air work.

Test findings covering one room of the residence brought out some interesting disclosures on the behavior of baseboard and high side wall registers under different register velocities.

The most important research described preliminary findings on commercial type air washers. These tests cover the humidity delivered, effect of pressure, nozzles, entering water temperature, efficiency, over-

all performance, condensation and water consumption. These tests are only preliminary and a further report will be given at the December meeting.

## Addresses

Much favorable comment was heard from those attending praising the selection of speakers and topics assigned. In general, all the speakers were well qualified to handle the subject assigned, they talked to the point and brought out many interesting observations.

During the morning session, Tuesday, Clarence A. Olsen, Fox Furnace Company, delivered an inspiring talk on the subject "Merchandising For Profit."

Although the title of Mr. Olsen's talk was "Merchandising for Profit in Our Industry," he took the liberty of digressing because he felt that it would be more interesting and more important to talk about what our industry has to look forward to, rather than cry over the past.

He told of the experiences of C. K. Foster, one of the oldest American Radiator salesmen, using this illustration because he felt it had a story and a lesson. Mr. Foster was one of the men who originally introduced boilers and radiators for home heating. He started out handicapped by the fact that there was no such thing as a steam fitter and the only heating done by steam was confined to factories and industrial buildings and not proving any too satisfactory—plenty of explosions, etc.

In spite of all the drawbacks, setbacks and hardships, steam won out because the men who were selling it had confidence in the product they had to sell.

"In the warm air heating industry, however, it is different. The public wants what we have to sell—the public is ahead of us. It wants air-conditioning, forced air, humidified air, inconspicuous grilles.



W. L. McGrath  
President

"We are sitting on top of the bandwagon. Other industries envy us. Out of the past three years of depression a lot of good has developed. There has been more progress made during this depression period than at any other time. Manufacturers have been busy improving their product, more research has been done, more effort on the part of the dealers to educate themselves. We have hit bottom and business is starting upward."

A technical, but comprehensive paper on insulation in buildings was delivered by M. A. Smith of the U. S. Gypsum Co. Mr. Smith gave some of the history of insulation, explained how insulation affects heat transfer and pointed out in detail the importance of insulation in air conditioning work. He emphasized some of the findings on insulation, particularly that the coefficient of heat transmission of the insulation material alone is not a true indicator of the final coefficient of the completed wall.

Mr. Smith also pointed out the places where insulation is of most value, such as attic floors for ceiling insulation, walls and roofs where the roof is a part of the room wall. He described briefly the many kinds of insulation now on the market and gave some pointers on selecting the proper insulation.

#### Round Table

On Wednesday afternoon a forum discussion was held with three speakers covering widely different subjects. J. H. Van Alsborg of the Hart and Cooley Manufacturing Company, spoke on "Registers and Grilles for Mechanical and Gravity Heating." The high lights of this paper will be published in a later issue.

The following speaker, F. E. Mehrings, of the Meyer Furnace Co., discussed "The Opportunity For Air Conditioning in Replacement Work." Some of Mr. Mehrings paper is published in this issue.

L. R. Taylor, International Heater Company, speaking on the subject



Allen W. Williams  
Managing Director and Treasurer

"Rackets in Our Industry," brought out some facts which proved of intense interest to his listeners. In order Mr. Taylor brought out the following practices which he termed rackets:

1. Taking cash discounts after the discount period has lapsed.
2. Deducting the cash discount before the freight allowance has been subtracted.
3. Getting mad at the credit manager because he tries to do his job and taking out the spite on the traveling salesman who may or may not know what the argument is all about.
4. Reversing telephone calls which are not orders but often



A. C. Willard  
Director of Research

trivial excuses for adding to the manufacturer's expense.

5. Returning material to manufacturers without first telling the manufacturer that the material is being returned and giving some reason for rejecting the purchase.

6. Asking the manufacturer to assume "breakage in transit" costs when the hauling company is to blame and usually assumes the expense.

7. Claiming replacements or deductions for defective parts without carefully checking to see if the right parts were specified.

8. Demanding exclusive sale of parts no matter how large the territory claimed or the ability to furnish a good distributing setup.

9. Manufacturers who refuse to join or contribute to association activities cashing in and using findings and material disclosed and developed by paying members.

#### Reports

Professor J. D. Hoffman reporting for the Code Committee, stated that the second edition of the Mechanical Code is now available and discussed some of the changes that have been made. He pointed out that this code is designed primarily for the smaller sized, average house and will not work satisfactorily on the big house, the unusual house or the complicated installation. He further emphasized that this code is not exactly correct according to good engineering, but that the differences are so small that if the code is strictly followed in work to which it is adapted the percentage of error will not be harmful.

Harvey Manney reporting for the work with the Committee of Ten said that the Committee, like others, has been hit by lack of funds but will function with all its old vigor whenever business picks up. He was emphatic in recommending that something be done about the furnace cleaner manufacturer who is courting the coal dealer as a prospect for cleaners and who is also helping this coal dealer take cleaning business away from the legitimate heating man.



## Air Conditioning In Replacement Work

F. H. Mehrings

I feel that the term "replacement" in this case is a misnomer, although there is perhaps no better term for designating the revamping job or remodeling job as distinguished from the new house job. True, when a furnace is found to be in need of replacement, an excellent opportunity is afforded for the sale of a complete air conditioning unit and the idea of transforming the basement can be very effectively taken advantage of. But there are countless homes in which the existing warm air heating plant is serving its purpose most admirably even after twenty or thirty years and longer. I do not mean to imply that all cases of replacement of old furnaces which are still in good condition, are unjustified, because in many cases it is decidedly to the homeowner's advantage to replace an old, inefficient furnace with a new one of today's better design and construction.

Every single one of these heating plants is a veritable gold mine of legitimate business for the warm air heating and air conditioning contractor who can by the addition of forced circulation, air cleaning and humidification, together with the heater already present, provide the essentials of complete winter air conditioning.

There is scarcely any limit to the

extent one may go beyond the installation of positive circulation—because one thing calls for another; automatic control, air filters, washers, humidifiers and the more elaborate equipment for summer air conditioning as well. The installation of automatic controls alone offers almost unlimited possibilities.

Artificial cooling of buildings that are poorly insulated is still too expensive to be pursued as an enterprise out of which to make a success in the immediate future. But air conditioning in replacement or remodeling work brings immediate returns for every warm air heating plant can be converted at a nominal expense into a system that will provide all the essentials of winter air conditioning, and by means of the same equipment, a degree of summer comfort.

It is needless to point out that this field has been practically untouched. With few exceptions, every home is a prospect, including even those heated by other than warm air systems, but if we will confine ourselves to the central system we shall find ourselves with plenty of material to work on for some time to come.

It will do no harm to reiterate the importance of air conditioning, by virtue of which it commands foremost

consideration on the part of every homeowner. It should be only necessary to point out that a person can live for days without water and weeks without food but only minutes without air. And while most people are extremely scrupulous about the food they eat, the condition of the air they breathe seems to be taken for granted. The health appeal is one of the strongest in selling air conditioning.

Equal to cleansing in importance is humidification, the benefits of which are too well known to require discussion here, and there is a splendid array of humidifying equipment to choose from.

Every dealer knows, or should know, all about the heating of the homes in his community, such records being built up from repair and cleaning jobs or from straight house-to-house canvassing. Similarly, the manufacturer must have a general knowledge of his market in the territory served. And while air conditioning in connection with warm air heating is by no means limited to residences and other comparatively small buildings, I believe we are, after all, mainly interested in the field of home heating and air conditioning.

And when we stop to think of the comparatively small number of homes that have been built since the advent of air conditioning and the fractional percentage of homes which are air-conditioned, we begin to realize that there lies before us a vast field of potential possibilities that remains practically untouched.

## Columbia S. M. Co. Sells Coolers

[Continued from page 21]



This stainless steel, three-faucet cooler, is one of the de luxe numbers with a grille top, marble handled faucets and redwood frame for a mahogany finish.

and handling one-day orders. Most of these picnic coolers are picked up by the user at the store which eliminates delivery cost.

Mr. Weiner says—"This beer dispensing equipment came along at a time when our shop was looking for an activity which would keep the men and shop busy and also give us a profit on our operations. While we can't count on the volume we had during the first weeks when we had to work a day and a night shift, we do expect to see a steady patronage as new places open up and established dispensers enlarge or better their equipment. We have planned production so that our prices are reasonable without being cut throat and the units bring a good profit without any repair and replacement expense."

# Ventilation For A Hot Office

WITH air conditioning catching popular fancy, a large number of professional men having hot offices and waiting rooms for clients will be prospects for some type of cooling this summer, providing contractors can design a system which will be simple in plan, positive in operation and low in cost.

This demand can be met satisfactorily with a gravity installation, which is low in price, costs nothing to operate and does give a satisfactory condition providing the buyer is not over-sold. This system does not cool in the sense that artificial reduction of air temperature is obtained by water, ice or mechanical refrigeration, but it does cool by removing hot ceiling air from rooms.

This removal of ceiling air takes away the heated air, which radiates heat to persons sitting in the room. Inasmuch as many professional men have offices in one-story buildings or are next to the attic or roof, a gravity system of this type has a large field of application.

The system shown in the two

sketches operates on this principle. This system was designed and installed by the Midwest Ventilating Works, sheet metal and ventilation contractors, Milwaukee, Wis. The plan, as indicated, withdraws air from four rooms directly by means of a duct system and also from the hall and large waiting room indirectly through the pull from the smaller offices.

This particular system has two sources of heat to overcome. The first is sun heat on the roof; the second, heat from lamps and apparatus generating heat while in operation. This second source of heat was particularly acute in some of the small rooms where electrical treatments are given.

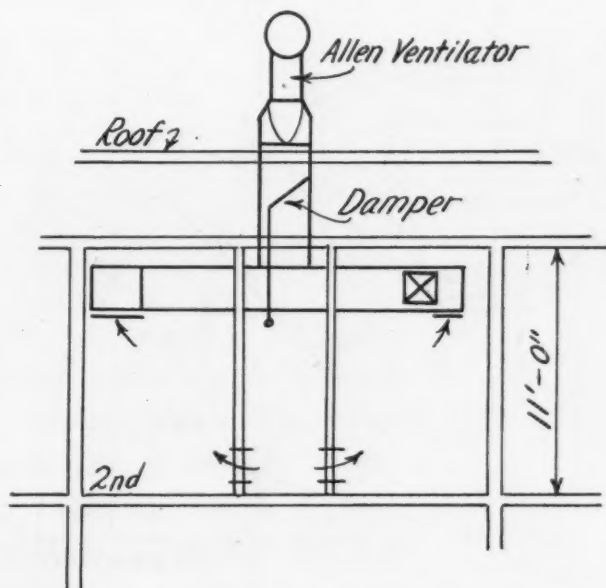
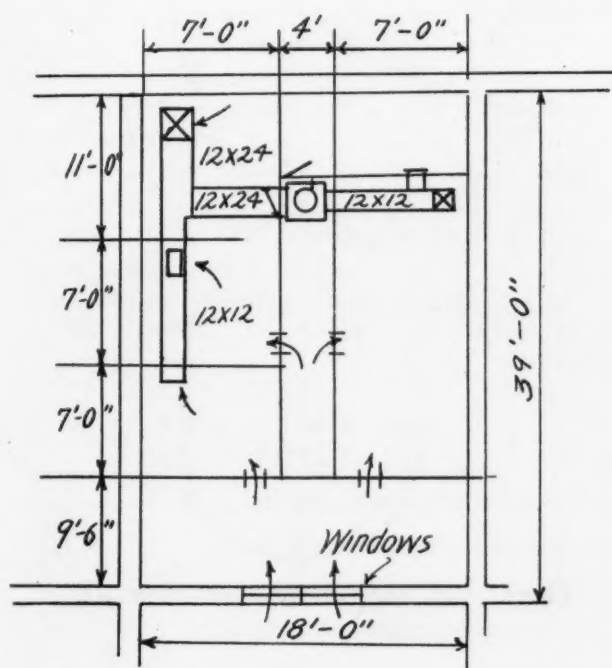
Air is removed through ducts placed inside the rooms and against the ceiling and having the grille faces placed in the bottom of the duct. The ducts are sized as shown on the sketches. All ducts are brought together in the rear section of the hall, where a plenum opens into the base of a 24-inch ventilator. The ventilator base is equipped with

a manually operated damper to permit closing off the unit in winter or cool weather.

The overall dimensions of the suite of rooms is 39 feet by 18 feet, with an 11-foot ceiling. This figures a total cubage of 7,720 feet. The ventilator has a capacity of 2,500 cubic feet per minute, so that the rooms are changed just about once every three minutes. This air change can occur, of course, only when the windows shown along the front are open so that there is no restriction to the pull of the ventilator.

In order to provide uniform flow of air, regardless of whether inside doors are open or closed, grilles through the partition are located in the baseboard, as shown in the floor plan.

The system operated all last summer through extremely hot weather and, according to the doctor, improved conditions in the suite so noticeably that he would not be without a system of this kind in the future.



The plan at the left and cross section at the right show the arrangement of the gravity ventilation system. The surprising results obtained with this economical layout indicate careful attention to all problems of heat removal.

# Elbow Intersecting A Straight Pipe

By L. F. Hyatt

Contributing Editor

**I**N INSTALLING blow pipe works it is often impractical to use two pipes of different diameters in the form of a common T joint. To insure an easy flow of air and avoid frictional resistance the connection is made in the form of a four-piece 90° elbow. This type of connection adds decidedly to the efficiency of the system.

Begin the elevation view by first drawing the angle  $X-Y-Z$ . Next draw the two arcs, the first one representing the desired throat measurement and the second being equal to the throat dimension plus the diameter of the elbow. Now using the dividers, divide the large arc into three equal spaces.

In finding the miter lines of any elbow, regardless of the number of pieces, divide the large arc inside the angle  $X, Y, Z$  into one less division than the desired number of pieces in the elbow.

In this case there would be 4 pieces in the elbow, hence the necessity of the three divisions in this particular pattern.

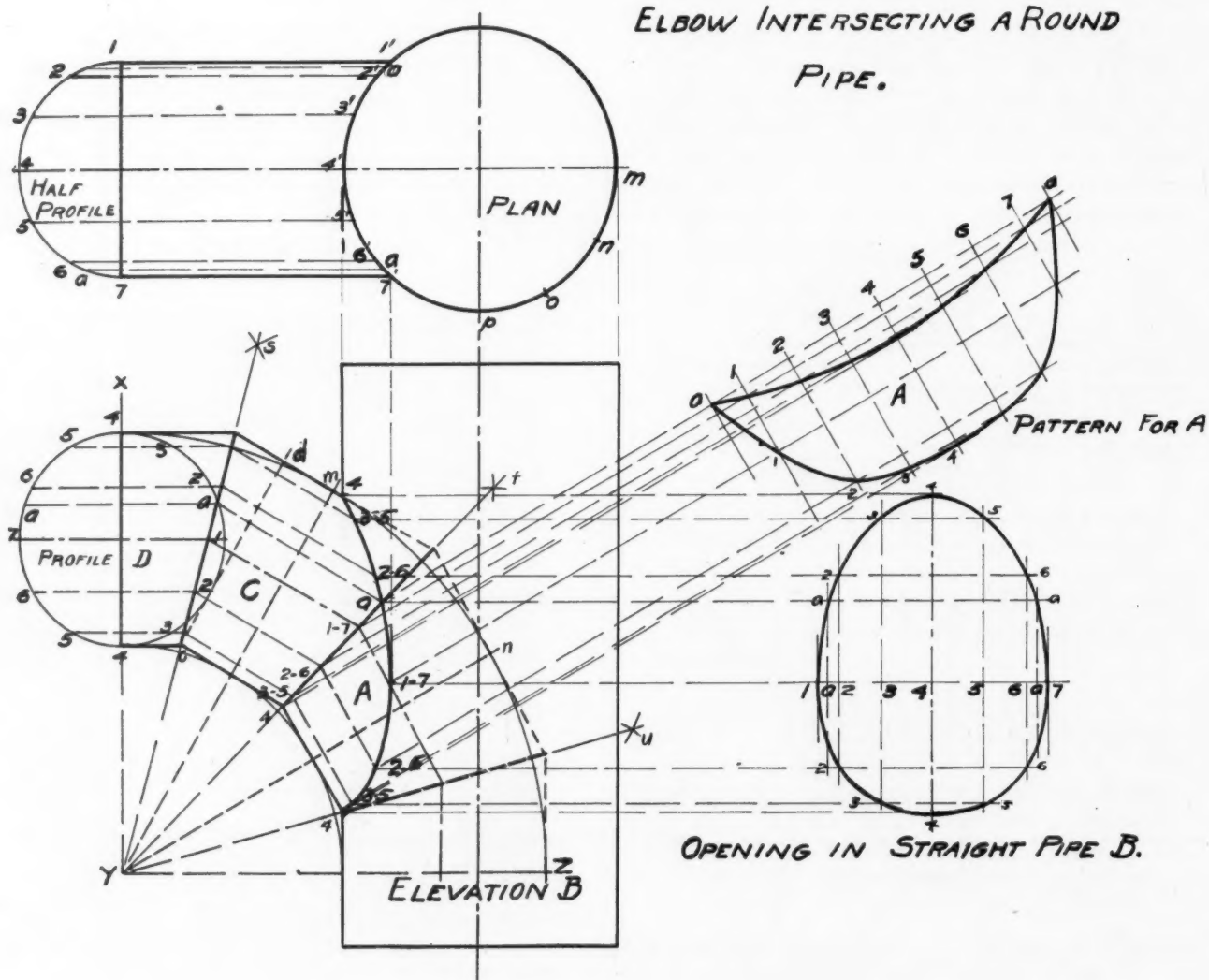
Now after the three divisions have been made take any radius and with  $q$  and  $m$  as centers strike arcs intersecting each other locating point  $S$  and from this point draw a line to point  $Y$ . This is the first miter line. Do likewise to obtain the other two miter lines  $t$  and  $u$ .

Draw a circle representing the

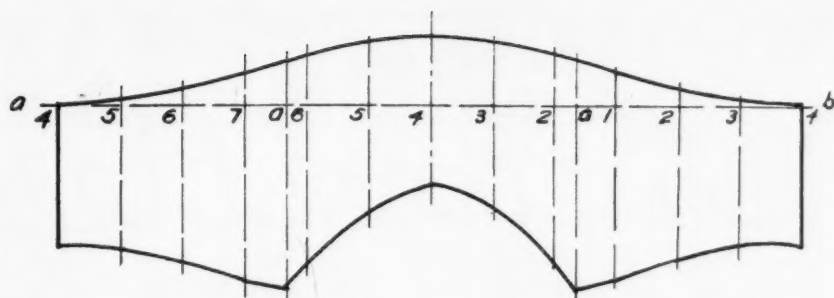
opening of the elbow and number it as shown, profile  $D$ . From points  $q$  draw horizontal lines intersecting the miter line  $Y-S$ . Then from these two points of intersection draw lines tangent with the large and small quarter circles allowing them to intersect the next miter line  $t$ .

Again draw lines from the points of intersection on  $t$  tangent to the two arcs intersecting the miter line  $u$ , and this time draw vertical lines from the points of intersection on the miter line. These vertical lines will intersect the horizontal lines  $Y-Z$  at the point of intersection of the two arcs with  $Y-Z$ .

Next draw the vertical pipe in







PATTERN FOR C

position as shown at B. Before the line of intersection can be determined, the plan view must be completed. Only a half profile of the small pipe is drawn on the plan view. This half profile is numbered as shown, and horizontal lines are drawn so as to intersect the circle representing the opening in the straight pipe.

These points are numbered 1, 2, 3, etc. Now draw horizontal lines from all points on profile D so as to intersect the miter lines as shown except points a which can not be located until the line of intersection in the elevation view is drawn. Vertical lines are now drawn from points 1, 2, 3, etc., in the plan view so as to intersect the lines which were drawn parallel to the outline of the elbow. The points are numbered as shown by the points 4, 5, 6, 7, etc. and the line of intersection is drawn through these points in the elevation view.

Next erect a perpendicular from point a on the elevation view, to the plan view, locating point a. Then draw a horizontal line locating point a in the half profile.

We are now ready to begin the development of patterns for the

different pieces. From point a on the line of intersection draw a line at right angles to the center line of this section of the elbow, and upon this line step off the distance a to 1, 1 to 2, etc., up to and including 7 to a found on profile D.

At right angles to this line draw lines through each of these points. Draw lines from the points on the line of intersection and the miter line to lines of like number, as shown in the pattern for A. Through these points draw the curved lines, thus completing pattern A.

Next draw the pattern for B. The opening only is shown as the width of the piece is of course equal to the height of the straight piece, and the length of the piece is equal to four times the length of the spaces shown on the plan view by the letters m, n, o, p.

To get the pattern for the opening, first draw the horizontal line from point 1-7 and upon this line step off the distances 1, a, 2, 3, 4, 5, 6, a, 7 found on the plan view, and through each point draw a line at right angles to the line just drawn.

Now draw the other horizontal

lines from the latter points of intersection intersecting the vertical lines of like number on the opening. Through these points draw the curved line describing the outline of the opening in the straight pipe B.

Now proceed with pattern for C. Draw the dash line c-d as shown on the elevation view. Begin the pattern by first drawing the horizontal line a-b, of an indefinite length and upon this line step off the distance 4, 5, 6, 7, etc., as found on the profile D. The seam is on the throat side. It is important that point a be located accurately on the line a-b.

Now through each of these points draw lines of an indefinite length at right angles to a-b. Next take the distance from point 4 on section C of the elbow, to d and step it off on the center line 4 on the pattern and also step off the distance d to miter line s above the horizontal line a-b. Now take the distance from the point 3-5 to dash line c-d and step this off below the horizontal line on vertical lines through points 3 and 5. Also take the distance from dash line c-d to miter line s and step it off on the same vertical lines above center line a-b.

Continue with all of the lines and point a. After all of the lines have been carefully located on the vertical lines, the curved lines are drawn, thus completing the pattern for C. The upper end of the pattern C may be used as a template for marking out the pattern for the remaining piece of the elbow.

No seams or allowances have been made for assembling.

Patterns published in American Artisan are usually developed from specific requests from readers. This service is open to all subscribers and is free of charge. If you have patterns to be worked out send as clear a drawing and as much information as possible. Remember the editor is not acquainted with details and must be given instructions.

# ASSOCIATION

## Activities

### Chicago Associations Learn and Play

ON Friday evening, June 23, Republic Metals, Inc., 2222 W. 49th St., Chicago, entertained the three furnace and sheet metal associations of the city with a program of education, refreshments and music. The party was a distinct success, with something like four hundred men in attendance, and with Walter Joy, of the Republic firm as the peppy master of ceremonies.

The three associations represented were The Furnace and Sheet Metal Institute, the Master Furnace and Sheet Metal Association and the South End Sheet Metal Employers Association. After the introduction of association officers and visitors, the educational program was run through quickly, and then the cleverly masked bar and refreshment table were uncovered.

The speakers on the program were: Ned Cummings of Richardson and Boynton who spoke on "Furnace Business in 1933"; I. W. Rowell, general manager, Lakeside-Furbrow Co., "Air Conditioning Possibilities"; J. F. Jaap of Cook Electric Co., "Getting Into the House with a Regulator Story"; David Jones of Russell Electric Co., "Selling Regulators"; Grant Wilson of Grant Wilson, Inc., "Expanding the Furnace Cleaning Order by Repapering the Furnaces with Asbestos"; Ed Driscoll, of Certain-Teed Products Co., "Opportunities in the Prepared Roofing Field"; and Platte Overton, "Is the Packaged Air Conditioning Unit Practical?"

The general tone of all of the speeches was optimistic, with the expectation of better business for the last six months of this year.

The following officers represented

the various associations: C. L. Willey, President, M. Serson, Treasurer, and Paul Barth, Secretary of the Master Furnace and Sheet Metal Association; Jack Weiner, President, Geo. Monroe, Vice-President, Maurice DeWolf, Secretary and Treasurer of the Furnace and Sheet Metal Institute; N. C. Dexter, President and J. Medima, Secretary and Treasurer of the South End Sheet Metal Employers Association. Paul Bier-sach, Secretary of the Sheet Metal Contractors Association of Wisconsin was also present, and Mr. Joy called on him for a brief talk on association matters and the industrial recovery act.

### Des Moines Organizes to Raise Standards

Seven prominent heating equipment manufacturers of Des Moines, Iowa, have organized the Air Conditioning and Warm Air Heating Engineers Association of Des Moines for the specific purpose of raising the standard of air conditioning and warm air heating engineering and installation in Des Moines.

The association meets each Friday noon at which time subjects pertinent to the purpose of the association are discussed by competent authorities.

The firms represented in the new association are: Campbell Heating Company, Capital City Sheet Metal, Green Foundry & Furnace Works, Model Stove & Furnace Company, Quick Furnace & Supply Company, Van Dyck Furnace Company and Blosser Furnace & Sheet Metal Company.

A group of rules has been drawn up setting forth the purposes of the organization. Among the rules are

—each member pledges himself to install gravity jobs, including replacements, according to the Standard Code; all forced air or air conditioning jobs are to be installed according to the new mechanical code; air conditioning shall be defined as the science of heating, humidifying, circulating, and cleaning the air with all operations under full automatic control.

The association members agree to take out a furnace permit for all jobs so that the owner shall be protected. A committee appointed by the president inspects each job installed by members of the association to see that high standards are maintained.

A. B. Meston, of the Quick Furnace & Supply Company, Des Moines, is secretary of the association.

### Indianapolis Metal Craft Club Picnic

The Metal Craft Club of Indianapolis women held a picnic June 10 at Brookside Park for their husbands and families.

An enjoyable picnic dinner was served to approximately seventy-five members and families.

Due to the extremely hot weather the ladies spent a rather quiet afternoon while the men had an enthusiastic game of baseball. Later in the afternoon everyone participated in enjoyable games.

Out of town members attending were: Mr. and Mrs. Baum and daughter of Lafayette, Ind., and Mr. and Mrs. Smith, Mrs. Ayers and daughters all of Flora, Ind.

The officers of the auxiliary are: Mesdames Guy Lefforge, president; Elmer Mullin, vice-president; Harry Peterson, treasurer; and Charles McManama, secretary.





A

AMERICAN ARTISAN

# Automatic Heat *and* Air Conditioning Section

AS business picks up and home owners begin to remodel, replace and buy new heating systems, air conditioning unquestionably will assume the important place allotted it before general conditions interrupted its march toward public acceptance.

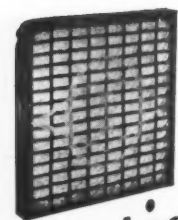
- - - Vastly important among the classes of prospects warm air heating contractors will develop will be owners of hot water, steam and vapor systems who want the air circulation, humidity and healthful atmosphere made possible only by forced air.

- - - Many of these owners will want to save as much of their present system as possible. For this class of prospect the type of conditioning system described in this month's Automatic Heating Section is admirably suited. With a system of this type humidity can be assured, air circulation provided and a general betterment of interior conditions guaranteed.

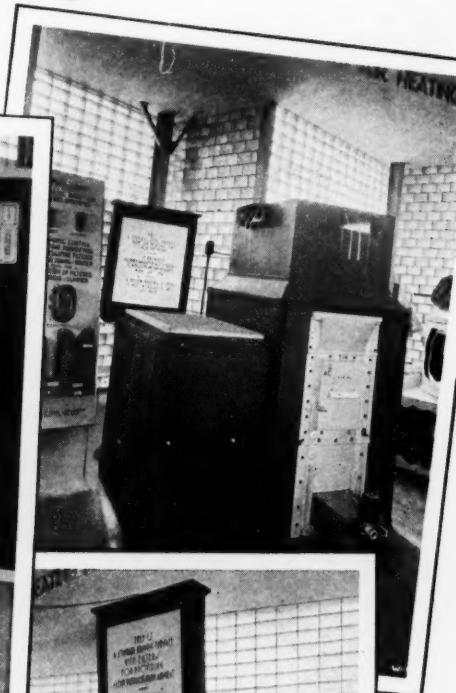
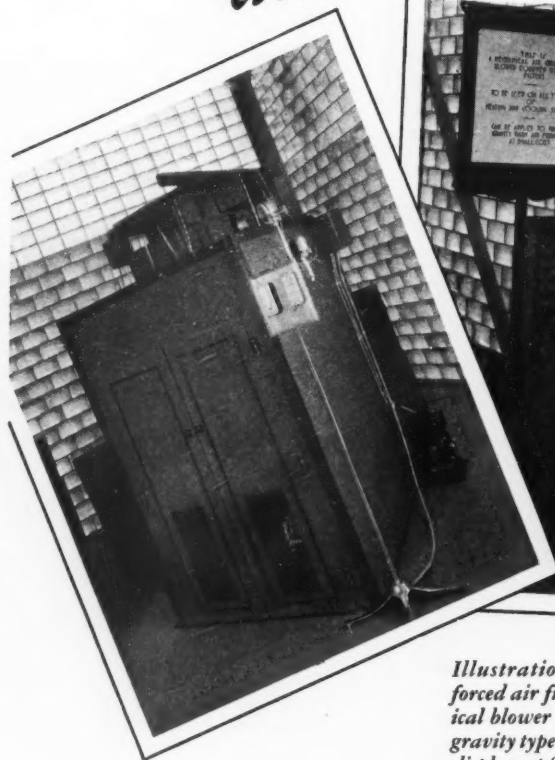
- - - Such a system retains the existing heat supply, and provides conditioning at a cost well within the limits of the most modest pocketbook. The test data presented in this article contain all the reasons why any owner should buy the service we have to offer.







# National Warm Air Heating and Air Conditioning Association



*Illustrations show standard forced air furnaces and mechanical blower (above) and typical gravity type furnace (at right) on display at "A Century of Progress". All are Dustop equipped.*

## At "A CENTURY OF PROGRESS"

● With attendance at the Owens-Illinois Glass Block Building running as high as 45,000 in a single day, people from all parts of the world are inspecting the exhibit of the National Warm Air Heating and Air Conditioning Association at "A Century of Progress"—and learning the story of *clean* warm air. Typical 1933 models of forced air and gravity type furnaces are on display—all are filter equipped.

Dustop glass wool filters offer advantages in dirt removing effectiveness, capacity and maintenance ex-

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## Air Conditioning A Radiator Heated Home



**I**F you are a typical warm air heating contractor working to establish yourself in air conditioning, you undoubtedly have looked long and speculatively at the hundreds of nice homes in your community which are heated by steam, vapor or hot water and wondered how you could sell air conditioning to these owners.

Perhaps you have hit upon the recipe for sales of this kind, but if you are really an average dealer you have not made much progress with these owners other than trying to sell them a completely new heating plant.

This article describes in detail the equipment and results obtained by one contractor who has worked out a formula and is well on his way to capture this appealing market.

The contractor's name is Martin C. Koeberle and his home town is Sumner, Iowa. Sumner, by the way, is about 120 miles from Des Moines and has a population of about 1,600 persons. In addition to warm air heating, the Koeberle firm also sells oil burners, plumbing, and hardware. The market is not specialized as in big cities, but being a banking town and shopping center Sumner has many fine homes.

The system which is described here was installed in Mr. Koeberle's own home so that complete information might be secured on the operating characteristics of the idea.

In order to appreciate exactly what this system actually does a description of the house and its first heating system faults should be understood. The house is two-story frame heated by a vapor system with radiators as shown on the piping plan. So far as heat is concerned the house was always warm.

The conditioner (all shop made) consists of a blower and filter section inserted in a vertical collecting return, a large elbow in which the sprays are mounted, and a supply system which passes the conditioned air into the rooms through registers placed in the floor under the radiators. The photographs show the heart of the system.

The chief faults were as follows: Mrs. Koeberle was always distressed during the heating season with nose and throat ailments induced by the dry, dusty and motionless air of the vapor heat. Also, the boiler was hand fired, whereas in the new installation oil is used, eliminating all personal attention. A further fault was slow morning pickup with several early morning hours too cool for real comfort. As a last complaint, Mr. Koeberle thought his heating bill higher than warranted because of the necessity of carrying higher interior temperatures due to dry air.

The piping plan shows the general design of the system and the location of supplies and returns. One of the photographs shows a typical floor register located under a radiator. The conditioner was placed toward one corner of the basement with trunk lines run in two directions.

The shorter main serves the front of the living room through a large 20 by 4-inch register. The longer main serves the kitchen, dining room, living room through 3 by 10-inch branches brought together to form a continuing rectangular main to the conditioner. As shown on one of the details, the branches terminate in 90-degree wide mouthed elbows under the radiators.

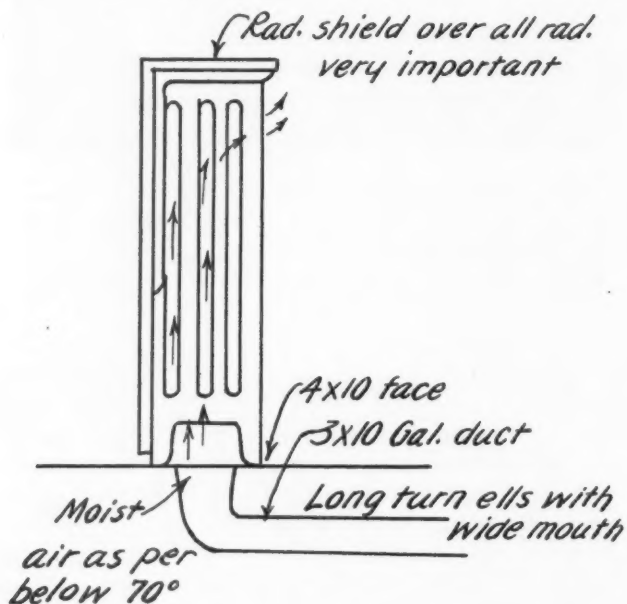
The conditioning system was laid out for rectangular ducts running from the conditioner, located in one corner, across the basement to the radiators which are along outside walls. The arrangement of the system is shown in this basement piping plan.

The register face is placed under the center point of the radiator at the top of the elbow.

Air is returned to the conditioner through three branches between joists and full iron lined—two from the living room and one from the dining room. These have larger faces (12 by 10) and are brought to the top of the conditioner where the rectangular pipe is changed to round pipe.

#### Equipment

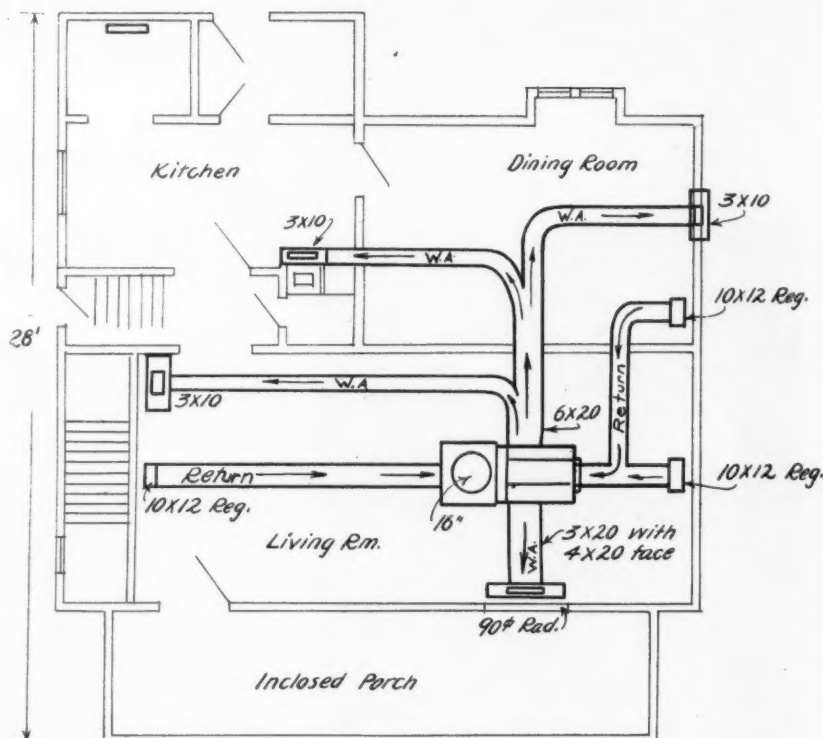
The conditioner which forms the heart of the system is interesting because of its design and construction and because of the preliminary experimentation to get a unit specifically adapted to the problem.



Every radiator has a shield as shown here. This was found important in the control and distribution of incoming air through the radiator sections and for guidance of the air stream across the room. The arrangement is shown above while the house is shown in the photograph.

The conditioner consists of a blower placed directly below the large round pipe of the return system. Above the wheel there is a section of dry filters as shown in the photograph. At the outlet of the blower a rectangular section connects the blower with the humidifier.

One of the details shows the construction of the humidifier which consists of a large elbow with the spray line inserted at about the middle point of the outside arc of the elbow. A centered reversing elbow



changes the supply duct from spray housing to vertical supply duct sized as shown in a detail.

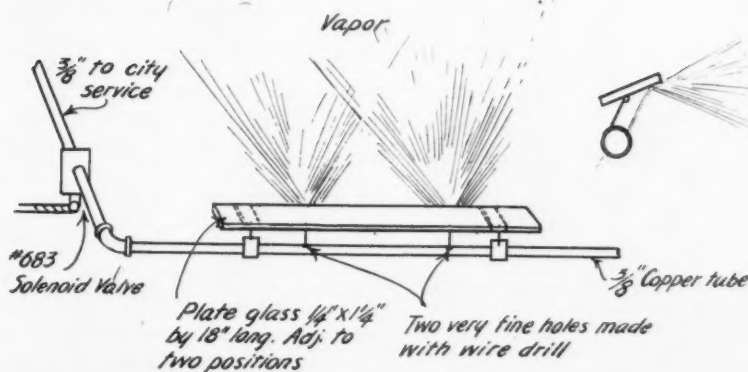
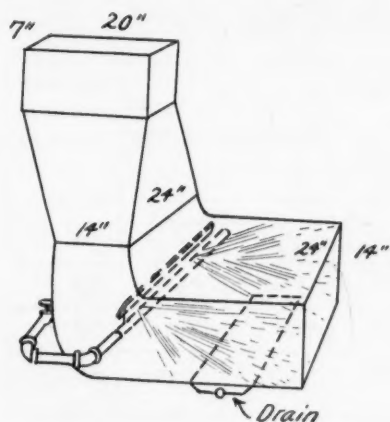
The blower was specially fabricated by the Koeberle company for the particular installation. The system requires a very low volume blower so a standard wheel was housed in a special cabinet 24 by 16 inches in floor area and 30 inches high with a special rectangular to round transition above the filter section.

This special blower was required because the system calls for low velocities and much lower capacities than usually furnished in standard blowers. The blower operates at 600 R. P. M. and delivers 367 cubic feet of air per minute.

The humidifier is even more interesting because it is entirely shop made from experimental data compiled on the job. One of the first problems encountered was that of getting a spray so finely divided that the water pressure used, the low velocity and amount of air passed would be so balanced that water consumption would be low and no suspended water would pass into the duct system.

Several types of spray heads were tried out before.





The two drawings above show the heart of the spray system. The spray line is mounted at the back turn of the large elbow and the spray is directed against the air flow. Water drains out as shown. The spray line shoots the water sprays against an adjustable glass diffuser which breaks up the stream to a mist and also controls the direction of mist flow. Adjustment of the glass governs the amount of moisture put into the air (see text for complete description).

Mr. Koeberle decided that some means for mechanically breaking up the water was required and after some experimentation developed the spray now in use. This consists of two holes drilled in the water supply pipe. This supply pipe, which is a  $\frac{3}{8}$ -inch copper tube, also supports a piece of plate glass held at such an angle that the water from the holes strikes the under side of the glass with a force sufficient to break the stream into a very fine mist and also directs this mist against the incoming stream of air from the blower. The glass also deflects the fog so that every section of the spray chamber has an equal amount of water fog. This construction is shown in two of the drawings.

To operate this spray a pressure of 55 pounds is maintained by a valve. Tests conducted show that the water consumption is about 5 quarts of water per hour and of this five quarts almost any amount can be wasted by adjusting the pitch of the glass. For example, one adjustment will waste four quarts out of five putting one quart actually into the house. Another adjustment will waste only one pint of water putting four and one-half quarts of water in the house.

### Operation

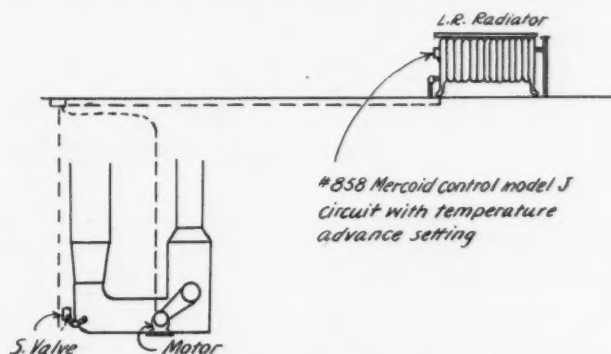
The value of this is that with a system of this kind it is essential that the washer operate in cycle with the blower and too much water put into the air-stream raises the relative humidity rapidly because there is no humidity control or registering device. In the ideal system the sprays run as nearly in cycle with the blower as possible. Therefore, the less moisture per cubic foot of air passed broken into suspended vapor, permits the sprays to operate through longer periods and provides more uniform room conditions. The excess water wasted is not really wasted because the water which is not passed into the house serves to wash the air and give that springlike feeling so desirable.

At some times condensation appeared on the lower 3 inches of the bottom sash. Storm sash were used.

It is readily understood that in systems of this kind some real operating problems must be solved. For instance, when should the blower and spray come on and how long should they operate. Obviously the

spray must be controlled either by a humidistat in the house or so set that under average weather conditions the "on" cycle of the sprays will be long enough to provide adequate humidity but not so long that too much humidity with window condensation and other faults inevitably develop. In this installation no humidistat is used, but the "on" cycle of the sprays was regulated so that the percentage of humidity desired was obtained by reducing the moisture per cubic foot until the sprays could be left on all during the "on" cycle of the fan regardless of any outside conditions. As now controlled the sprays run in cycle with the blower and control of the humidity is obtained by regulating the water pressure up or down according to outside conditions. The blower, likewise, must not run while the radiators are cold and should operate while predetermined temperatures obtain in the radiators.

This control problem was solved by mounting a Mercoid number 858 control on the return pipe from the radiator in the living room. This control was in turn connected with the solenoid valve on the spray line and with the motor of the blower. The control has a range of some 100 degrees with a maximum of 200 degrees. The highest setting was used. When the radiator heated up to 200 degrees the blower and spray turned on and continued until the temperature



The conditioner is controlled by a thermostat mounted on the radiator return pipe. The conditioner can come on only when the radiator is all hot. A low temperature setting was experimented with to get a setting which allowed the conditioner to operate a certain length of time each hour.



### TEST RUNS WITH CONDITIONER ON

The chart shown here is the real answer to whether or not this system really works. Note the varying conditions under which tests were made and note especially how the conditioner made room temperatures uniform, insured humidity as compared with the typical test with the conditioner out of use. Note also the operating cycles of the conditioner.

Date of Test	Outside Temp.	Weather Conditions	INSIDE TEMPERATURES			Relative Humidity	Time Burner is on per hour	Time Conditioner is on per hr.
			Ceiling	Breathing Line	Floor			
2/28/33	+32°	Clear S.W. Wind	78°	76°	72°	44%**	6 min.	30 min.
3/28/33	+39°	Clear N.W. Wind	81°	77°	76°	46%**	6 min.	30 "
3/7/32	+30°	Cloudy N.W. Wind	78°	76°	74°	59%**	8 min.	30 "
12/11/32	-12°	Clear, no wind	76°	74°	71°	43%**	25 min.	30 "
12/15/32	Zero	Clear N.W. Wind	78°	76°	71°	38%**	25 min.	30 "
<b>TEST RUN WITH CONDITIONER NOT IN USE</b>								
2/11/32	Zero	Clear N. Wind	84°	76°	71°	33%**	20 min	—

Inside temperature readings were all taken ten minutes after the oil burner shut down with room thermostat set at 72 degrees and conditioner operating.

\*\*Humidity tests made with a Humidiguide placed at breathing line level and on the wall opposite the radiator and register. Air registering, therefore, had to travel to ceiling and across room to register.

in the radiator dropped to the low setting of the control.

As this is an oil burner fired boiler, the room thermostat turns the burner on and off. It was found that the blower could not be run in direct cycle with the oil burner because this raised the humidity to too high a percentage and that about 20 minutes out of each hour seemed to furnish sufficient humidity. For this reason the high setting of the radiator control was used.

The solenoid valve is on a circuit with switch near humidiguide, which can be normally controlled to bring the humidity up to desired point. The blower is also controlled with a separate switch so either can be run at will regardless of oil burner cycle. Tests have shown the job can be controlled satisfactory with a humidistat, and will be O. K. for the zero or below cycle of oil burner and very satisfactory with 30 degrees and above. As the tests have shown, the conditioner must run oftener at zero or below, which it does, but the solenoid valve is left on the switch, as the blower certainly helps the circulation and operates satisfactorily with the mercoird control on the radiator.

#### Results

Of course the really important question is, how does this system function? Is it satisfactory? The answer to these is yes and the proof of the answer is found in the tabulations which show typical

operating results under differing outside weather.

From observations and tests during the testing periods shown in the tables it was discovered that throughout the first floor rooms there is practically no variation in room temperatures at the three levels tested excepting in the kitchen where the radiation is somewhat more than required.

One very noticeable feature was the rapid increase in relative humidity shown on days when the outside weather was not very cold and damp or cloudy. This seemed to indicate that infiltration had considerable effect on the air in the house despite the drying effects of the radiator heat.

Another interesting observation was the distribution of air obtained in the rooms. Each radiator has a back and top shield as shown on one of the drawings. Air leaving the register travels up through the columns of the radiator and is deflected out into the room by the top shield. The air stream then moved up toward the ceiling and across the room then down the inside walls in a movement which was preceptible but not at all uncomfortable. This air stream also seemed to be quite warm and not chilling to a person sitting in a chair along the inside wall.

#### Costs

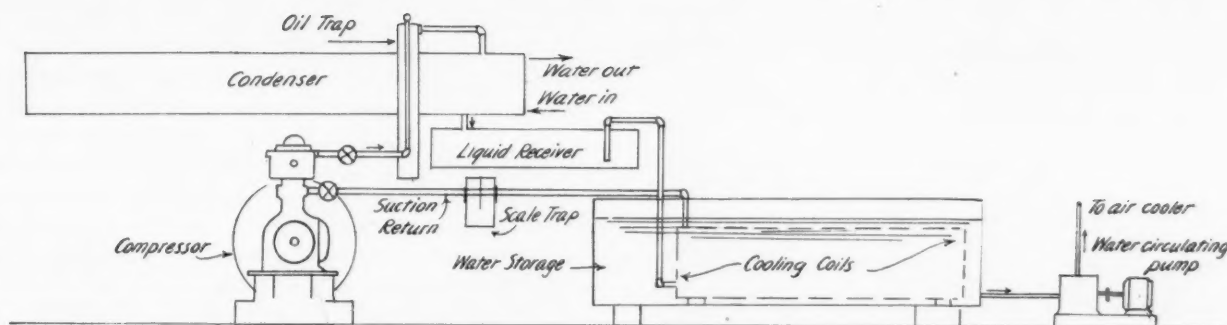
And where formerly half the morning was required to bring room temperatures up to a comfortable (Continued on page 41)

### TYPICAL OPERATING CYCLE

Outside Temp.	Min. per hour burner is on	Min. per hour conditioner is on.	No. of gals. per hour to spray	No. of gals. per hour wasted	No. of gals. per hour put in air	Water pressure
Zero	15 min.	25-30 min.	5 quarts	1 pint *	4 1/2 quarts	55 lb.
+32°	6 min.	25-30 min.	5 quarts	4 quarts *	1 quart	55 lb.

This chart shows typical operating cycles with data on consumption of fuel and water during two typical winter days.

\*Water wasted can be adjusted by tilting glass diffuser to vary vapor stream direction to incoming air.



MECHANICAL REFRIGERATION for COMFORT COOLING

Above is a schematic drawing of a typical refrigerating system for residential cooling. Parts are not, of course, arranged as they would be in an actual unit, but the relationship of parts is indicated.

# Comfort Cooling

By H. J. Macintire

## Part IV—Mechanical Refrigeration

**I**N all comfort cooling advantage can be taken of the use of night air except during exceptionally hot spells. Calculations using the data for the tests on comfort cooling of the research residence during the summer of 1932 indicated that except during several very hot periods the use of night air could reduce the period of operation about two hours.

Very little has been said in this series about the flexibility of unit coolers because of the desire to show how the existing warm air furnace system, the casing, ducts and risers, may be used for comfort cooling. However, it should be kept in mind that such an arrangement is a satisfactory one and may have decided advantages in cases where localized cooling is to be restricted to the dining room, living room and the bed room.

### Unit Coolers

The same flexibility is also true of furnace systems when using the registers for the delivery of the cool air, when the return air can be taken from every room individually. This means that in order to comfort cool a single room with the usual duct system it is often necessary to cool more than the single room unless a return duct is provided for each room to be cooled. Where this type of system is not available the unit cooler may be used for cooling individual rooms.

Unit coolers require that the cold water be circulated by the pump through the coils or the sprays in the unit cooler and that the supply and return lines be insulated at least enough to prevent sweating. The unit may be satisfactorily hidden in the wall panels, with the suction drawn in near the floor and the cool air delivered near the ceiling. Such an arrangement may be used to cool a single room, or several rooms. With a

proper installation the living or dining room may be cooled in the day time and the bed rooms at night.

As already pointed out the choice of a suitable system of comfort cooling is an extremely important matter. Omitting any consideration of the use of cold water for reasons already outlined or of the use of gas and silica gel because of the initial and operating costs, the choice must be made between ice and electric refrigeration. Ice can take a *heavy overload*, being limited to a large extent only by the ability to melt ice and circulate enough air. Heavy peak loads can be carried easily as a rule, whereas in periods of cool weather when little if any cooling is required the ice will remain in the ice tank with small loss until a demand for cooling arises. In these ways ice is almost ideal.

### Ice Costs

However ice is not cheap. It may be purchased for comfort cooling in some communities at prices as low as \$4.00 per ton, but the price for fractional tonnage delivery will average throughout the United States nearer \$5.00 per ton. Although it is not necessary to use crystal ice, or ice without cracks or checks as required for the household trade, it is a question whether any appreciable amount of opaque or shattered ice will be available for regular delivery unless ice is made especially for comfort cooling.

Undoubtedly a constant demand will be found in the future for the kind of ice hitherto considered as unmerchantable for cooling bottled goods, but the only ice that is available throughout the country today is the regular high quality ice of 300 or 400 lbs. cakes. So in making comparisons it appears that the factors to be considered are the greater first cost of the electric refrigerating machine complete ready to operate versus the greater operating cost occasioned by the use of

ice. Several such comparisons, given by B. S. Williams on the occasion of the fourth annual convention of the New England Ice Dealers Association, 1932, are as follows:

TABLE 1  
Air Conditioning of a Church  
(6 hours per week—16 weeks per year)

	Ice	Mechanical Refrigeration
Interest, taxes, insurance and depreciation at 20 per cent.....	\$ 400.00	\$ 2,000.00
Power cost at 3c per kw. hr.....		108.00
Water cost at 12c per M gal.....		83.00
Ice cost at \$4.00 per ton.....	768.00	
Repairs .....		300.00
Yearly cost .....	1,168.00	2,191.00
Initial cost .....	2,000.00	10,000.00

TABLE 2  
(Restaurant, operated 10 hrs. per day, 120 days per year.)

	Ice	Mechanical Refrigeration
Interest, taxes, insurance and depreciation at 20 per cent.....	\$ 330.00	\$ 440.00
Power at 3c per kw-hr. ....	27.00	148.00
Water cost at 12c per M gal.....		102.00
Ice cost at \$4.00 per ton.....	921.00	
Repairs .....		50.00
Yearly cost .....	1,278.00	732.00
Initial cost .....	1,650.00	2,200.00

The two tables show very closely why considerable care is necessary in the initial analysis of the problem. Some engineers will object to the first item of 20 per cent as excessive because it includes about 13 per cent for depreciation and obsolescence because they say that the electric refrigerating machine, with so little yearly service, should last for 25 years. The writer considers such estimates a very dangerous procedure as judged from average experience.

### Electric Refrigeration

In comfort cooling the main factor in making a selection of the kind of installation is the probable length of time of operation per year. Although in the tables the restaurant load is much larger than one would have in the average home the point is satisfactorily emphasized that there is a division between the kind of job best fitted for the use of ice and that best fitted for mechanical refrigeration.

Mechanical refrigeration, as we understand it, now is obtained by making some liquid absorb heat

whereby it boils and then compressing the vapor so formed by means of a machine so that the vapor may be returned to the liquid condition again. The volatile liquid may be any one of a score of refrigerants, but ammonia, sulphur dioxide, methyl chloride, freon and carbon dioxide are the best known. The machine may be compressor, similar in design to the air compressor, or it may be a heating element like the silica gel or the absorption machine designs.

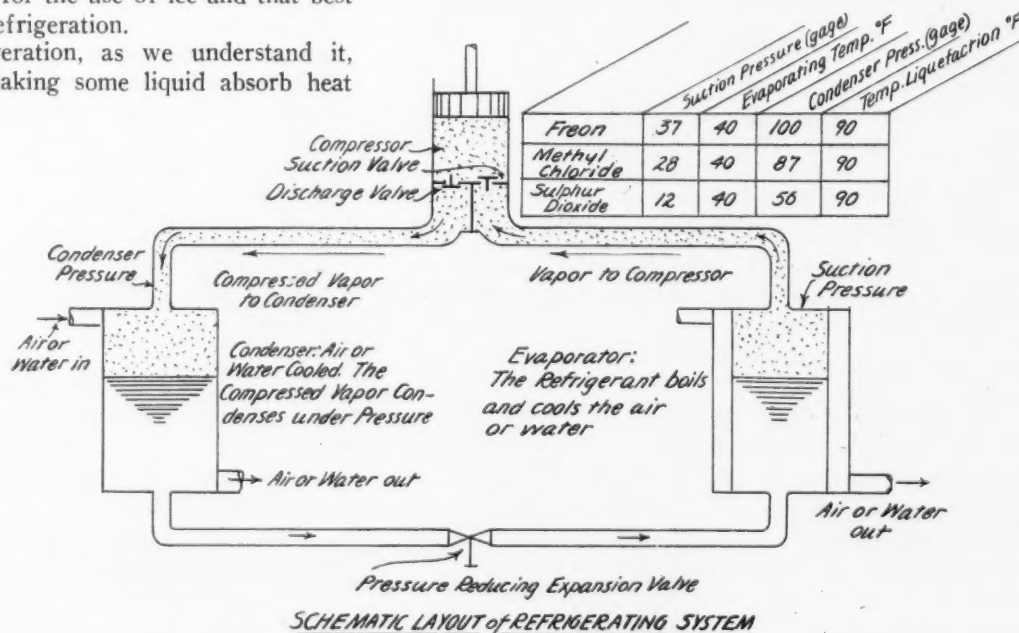
Consideration of the pressures in the system, the volume of gas to be handled and the danger should the vapor get out into the room eliminates most of these refrigerants so that for comfort cooling only methyl chloride or freon remain in most cases although carene is used where the centrifugal compressor is justified. The power required for the compressor is approximately the same in the case of all refrigerants, except carbon dioxide, which requires the most power. The cycle of operation can be seen from figure 2.

### The Refrigerating Machine

The refrigerating machine consists of four essential parts: the evaporator, the compressor, the condenser, and the pressure reducing valve called the *expansion valve*. In the evaporator the volatile liquid absorbs heat from the air or water if water sprays are used. It is here that the cooling is obtained and the rate of cooling depends on the number of pounds of the refrigerant boiled per minute. If heat is absorbed from the air at the rate of 200 B.t.u. per minute the machine is said to have a capacity of one ton of refrigeration. The temperature of evaporation depends on the kind of refrigerant used and on the pressure at which boiling takes place.

The compressor draws in the vapor formed during the boiling action in the evaporator and compresses the gas to a pressure great enough so that the refrigerant can be condensed again. A certain amount of heat has to be removed from the refrigerant by the condenser usually about 250 B.t.u. per ton of refrigeration per minute, which may be air cooled or water cooled

Fig. 2  
A mechanical refrigerating unit operates on physical laws shown in this schematic drawing. Parts which do the work shown may vary greatly in design and operation, but the principle of cooling is shown here.



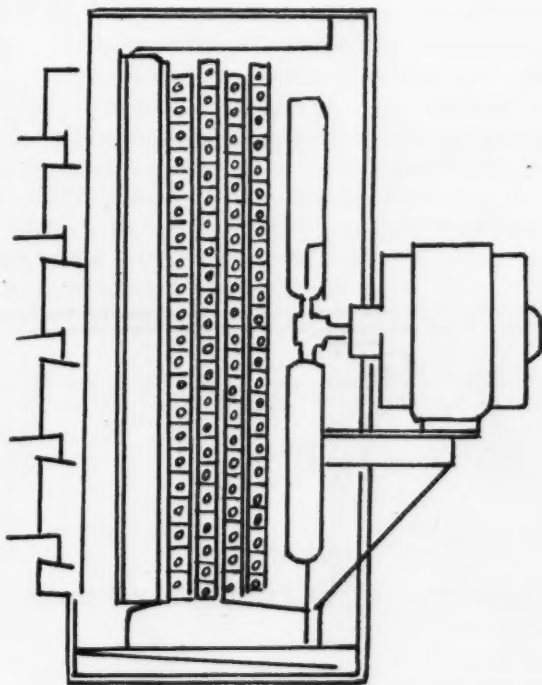


and the pressure in the condenser varies with the refrigerant and the temperature of the water, or air if the condenser is air cooled, leaving the condenser. The pressure in the condenser may be atmospheric in the case of carrene and 200-lb. per sq. in. for ammonia whereas sulphur dioxide, methyl chloride and freon are more nearly 100-lb. per sq. in. The compressor is simply a pump.

The pressure reducing or expansion valve may be simply a stop valve operated by hand, it may be designed so as to give an automatic control of the pressure in the evaporator, or it may be float valve which maintains a constant liquid level in the evaporator. The principal function of the valve is to control the temperature at which evaporation takes place in the evaporator.

#### Machine Requirements

In comfort cooling the first consideration in the design of mechanical refrigeration is that the machine be entirely automatic, that the operation be as noiseless

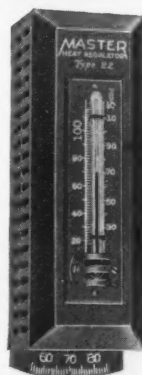


*Unit Cooler*

Unit coolers are of many types, but in operation the cooling medium is piped into the coils through which air is blown by the fan. Distribution of air is important.

as possible and that the unit be safe as regards toxic gases and inflammability. Without these the mechanical refrigerating machine is a failure.

The electric refrigerating machine has to be automatic in every respect. It must be thermostatically started and stopped with the rise or fall in the temperature of the water used in the spray chamber or through the cooling coils for cooling the air or of the temperature of the air in the conditioned rooms if direct expansion coils without water sprays are used. Air washing is not necessary in residential work but it is probable that better operation is possible where washers are used or the cooling coils are chilled with

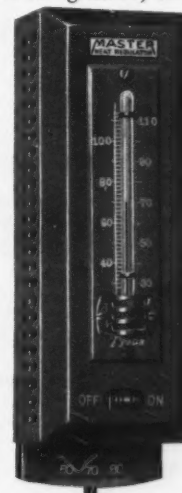


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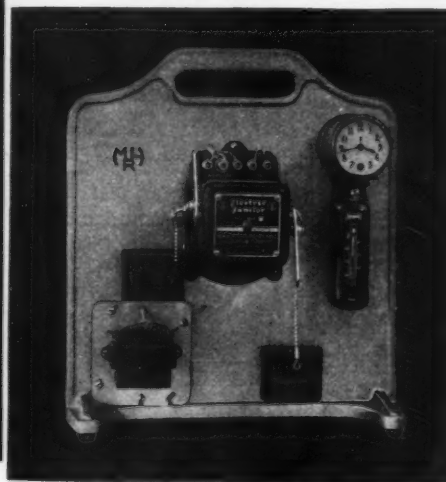
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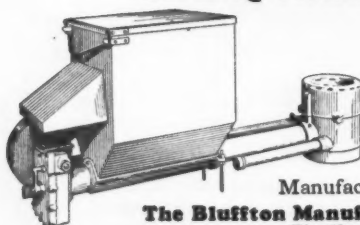
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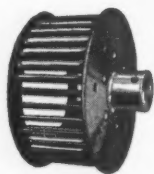
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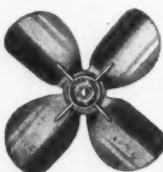


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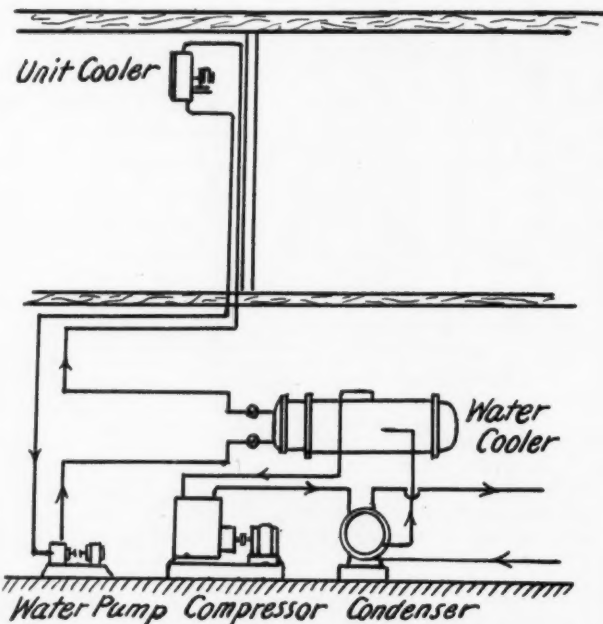
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cold water. Sufficient cold water storage for a short period of time will also permit satisfactory intermittent operation. There should be an overflow drain from the storage in order to waste the water as dehumidification of the air in the house occurs.

A suction pressure control by means of an expansion valve or a float valve, insures operation at a pressure which will give the best results. As this valve determines the pressure at which the refrigerant boils in the evaporating coils, the pressure must be the proper one for about 25 to 30 deg. F. boiling temperature. This will be about 15 to 20 lb. per sq. in. gage for methyl chloride, 39 to 44 lb. for ammonia and from 26 to 29 lb. per sq. in. gage for freon. In addition, the condenser pressure must be regulated in order to economize in the use of water, for of course water will be used in the condensers of units of the size required for comfort cooling except where individual rooms are cooled with machines of fractional tonnage capacity.

In condenser pressure control the water valve is operated by a coil spring set for the usual operating condenser pressure, one side of the diaphragm being subject to the condenser pressure. Therefore, when the thermostat shuts down the compressor the condenser pressure will decrease and the spring will finally shut the valve and stop the flow of water. As there is always some danger of an occasional shut down of the water supply an excess pressure valve to stop the compressor when the pressure reaches a maximum is a wise precaution. Finally, the design should be such so that there will be no danger of liquid return-



Unit cooler systems are generally assembled according to a plan like this. The number of unit cooler in the system governs the capacity of the basement equipment.

ing with the suction gas back to the compressor. Some piping designs will prevent this danger, otherwise a special trap or special expansion valve will be required.

The noise of the refrigeration machine has been given considerable attention of late years. Some machines are reasonably quiet during operation except when starting and stopping. In others the valves seem

to pound, and although this is hardly noticeable during the day time it becomes objectionable during the small hours of the morning. The gas operated absorption type of refrigerating machine is completely noiseless and it has been entirely successful in the fractional tonnage sizes, but it has not entered the comfort cooling field as yet.

Contrary to some belief the kind of refrigerant to be used is not determined by a consideration of the power required, as this is very nearly the same for all refrigerants operating between the same temperature limits in the evaporator and the condenser. The criterion is the refrigerant's safety features with reference to toxicity and inflammability. Leaks will occur at times in units of the kind used in comfort cooling. Although ammonia is the best known refrigerant and has been used successfully for over 50 years, the writer questions the wisdom of using ammonia in the ordinary residence where a lack of knowledge of the danger existing inside the piping, or fear due to ignorance of the means of repairing small leaks may easily cause considerable harm.

Methyl chloride has been used for some 8 to 10 years with varying success. The writer has not considered methyl chloride toxic nor can it be considered inflammable. Freon (F-12) is a chemical of more recent application to refrigeration. Both freon and methyl chloride appear to be perfectly satisfactory for use in air conditioning and comfort cooling, providing the compressor design insures satisfactory lubrication at all times.

## Conditioning A Radiator

### Heated House [Continued from page 36]

zone it is now possible to raise breathing line temperatures eight degrees in less than 20 minutes.

The complete system described, including all duct work and equipment, cost Mr. Koeberle \$94.00. This cost would be increased, of course, if all the equipment had been regularly manufactured merchandise, but because of the special requirements outlined, odd sized equipment had to be used.

During the previous heating season the coal bill for the heating plant, hand fired, was \$104.50. During the season in which the tests were run (October 6, 1932-May 9, 1933) with oil as the fuel and the conditioner in operation the cost was \$96.00 for 1,600 gallons of fuel oil at a price of six cents per gallon plus a cost of \$9.00 for the electrical power for the fan. Water for the conditioner comes from city main.

Tests have shown that when the conditioner is in operation the oil burner "on" cycles are less frequent and shorter saving as much as two quarts of oil in one cycle at zero outside. According to Mr. Koeberle's best calculations the conditioner saves from 15 to 25 per cent of the fuel bill.

Next winter it is planned to place a section of finned coil in the return to heat the air before passing through the sprays and have system under control of a humidistat.

## **Improved Again! MONCRIEF AIR CONDITIONER**

**With Series "C" Cast Furnace or  
Series "S" Steel Furnace as heating unit**

You can sell this air conditioner at an attractive figure and give the home owner all the benefits of modern air conditioning, using coal or oil as fuel. Fully equipped with Filter 98% efficient; Automatic Humidifier; Blower, variable speed, vibrationless, quiet running; all automatically regulated and controlled.

**THE HENRY FURNACE &  
FOUNDRY CO.**

**3471 E. 49th St., Cleveland, O.**

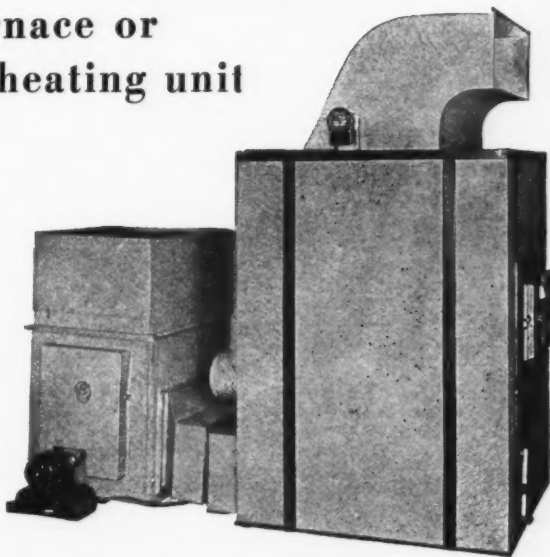
*Manufacturer of*

Air Conditioners  
Gas—Coal—Oil

Cast and Steel  
Furnaces

Warm Air Heating, Pipe and Fittings

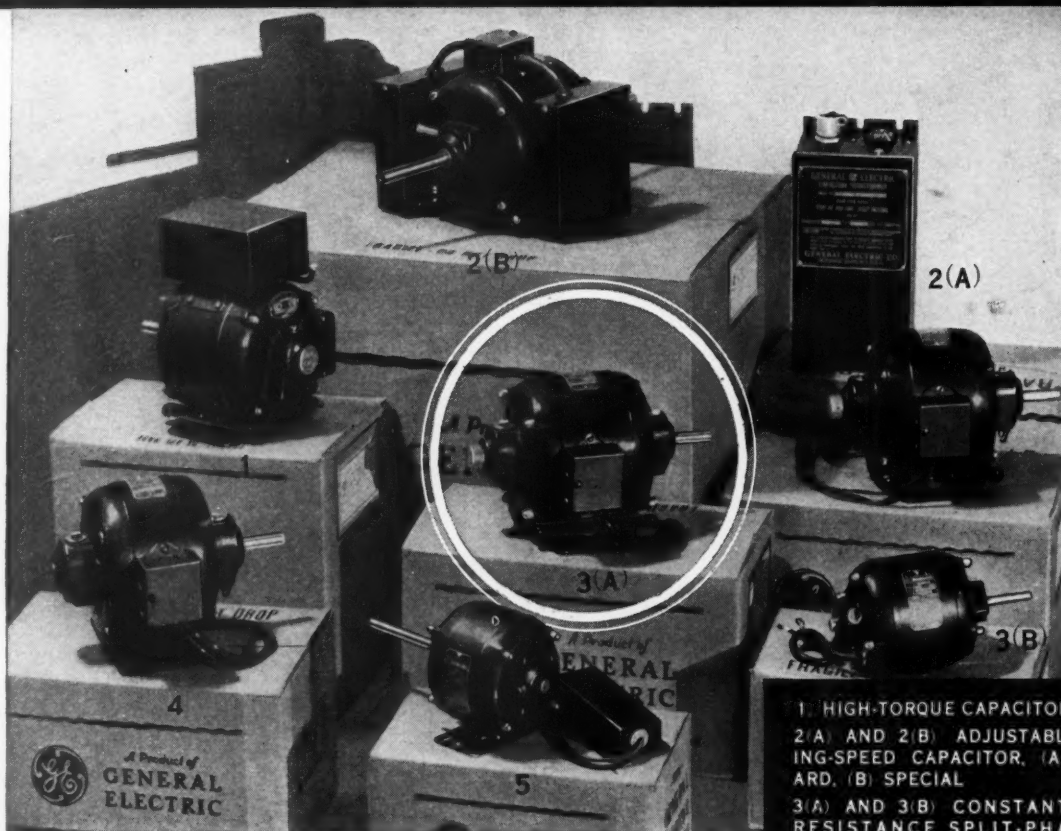
*Distributors and Warehouses in the Principal Cities*



**SEND FOR NEW INTERESTING CIRCULAR**  
on air conditioning, together with specifications of this and other Moncrief Air Conditioners and equipment. Just off the press. Write today.



## PACKAGES OF POWER FOR AIR CONDITIONING



- 1. HIGH-TORQUE CAPACITOR
- 2(A) AND 2(B). ADJUSTABLE VARYING-SPEED CAPACITOR. (A) STANDARD. (B) SPECIAL
- 3(A) AND 3(B). CONSTANT-SPEED, RESISTANCE SPLIT-PHASE. (A) STANDARD. (B) SPECIAL
- 4. CONSTANT-SPEED POLYPHASE
- 5. PERMANENT SPLIT-CAPACITOR

**WHERE CONSTANT SPEED IS REQUIRED . . .** for domestic air conditioning applications, exhaust fans, garage heaters, barn ventilators, and propeller fans of all kinds—General Electric recommends the Type KH constant-speed, resistance, split-phase motor for single-phase circuits (No. 3A above).

This motor is quiet because it is designed and built to be quiet. Its liberal and coordinated design, refined manufacturing tolerances, and balanced parts are your assurance that it will “deliver the goods” quietly and satisfactorily over a long operating life.

Our fractional-horsepower motor specialists, located in principal cities, will be glad to tell you more about the Type KH motor, and about our complete line of electric equipment—transformers, control, etc. General Electric, Schenectady, N. Y.

Check those fractional-horsepower motor applications concerning which you would like further information, and return this coupon to the nearest G-E office, or to General Electric, Dept. 6-201, Schenectady, N. Y.

Air Filters  
Air Washers  
Atomizers  
Automobile Heaters  
Barn Ventilators  
Bathroom Heaters  
Blowers (all types)  
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Bus Heaters

Cabinet-type Units for heating, cooling, humidifying, dehumidifying, washing, and filtering air  
Domestic Air Conditioners  
Exhaust Fans  
Fans  
Forced Draft Units  
Furnace Fans

Garage Heaters  
Humidifiers  
Incubator Fans  
Industrial Air Conditioners  
Kitchen Ventilators  
Paint Spray Booth Fans  
Propeller Fans (all types)  
Railway Car Air Conditioners  
Railway Car Precooling Units

Refrigerator Fans  
Room Coolers  
Rotary Roof Ventilators  
Schoolroom Heaters  
Special Devices  
Unit Coolers  
Unit Heaters  
Unit Ventilators  
Window Ventilators

210-218

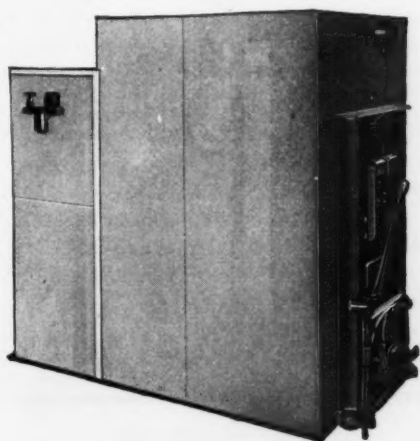
# GENERAL ELECTRIC



### Packaged Unit

The Premier Warm Air Heater Company of Dowagiac, Michigan, announces a new Standard Combination Unit consisting of a furnace, square casing, blower, filter and air washer all built as a single unit.

Due to its condensed design, advan-



tages of more efficient operation, easier installation and lower cost to both dealer and home owner are claimed for the new Standard Combination unit. Both blower and air washer are "built in" as the proper size for the furnace, greatly simplifying the estimating of sizes.

An unusual feature is that when air washing is not desired immediately, the new unit may be installed simply as a forced air unit, the air washer being installed at any later date without change to the blower.

Descriptive matter covering the new Premier Combination Unit may be had by addressing the Premier Company at Dowagiac.

### Chrom Copper

A new material known as chrom copper claimed to be rust proof, resistant to oxidation, acid and alkali resistant, is announced by the Apollo Metal Works, LaSalle, Illinois.

The new material is made by integrating copper and chromium. The resulting sheet cleans easily and forms up on the brake without difficulty. The sheets will be offered in polished and satin finishes. Each type will be offered in two grades—grade "A" being suitable for work where there is

no outside exposure or rough usage, while grade "AA" is suitable for fountains, bars, sinks, etc.

The material will be offered in all gauges from 14 to 48 oz.

Full information on prices, sizes, distribution can be obtained from the company.

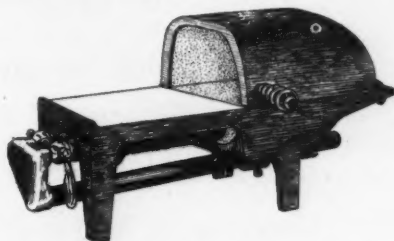
### New Starting Switch

A small, hand-operated starting switch, for providing complete protection against stalled-rotor current and injurious overload conditions, has been developed by the General Electric Company for use with either single-phase a-c. or d-c. fractional horsepower motors. The a-c. switch is available in single and double-pole forms. The new switch affords the following features: complete overload protection, a positive snap-action mechanism which is trip-free on overload, a sturdy and compact construction, and adaptability for mounting in purchasers' enclosures. The switch has been tested and listed by the Underwriters' Laboratories.

The switch is available in several forms as follows: open-type switches for applications where the purchaser wishes to provide his own enclosure; enclosed-type switches for general purpose applications, and switches for hazardous locations.

### Bench Furnace

A two burner, gas bench furnace for heating soldering irons in a specially designed fire box where temperatures of 1800 degrees can be maintained is being manufactured and sold



by the Red Devil Manufacturing Co., Bellwood, Ill.

The furnace can be used with one or two burners. The specially curved fire box, built of metal lined with fire clay, confines the flame to the iron tip. Information and prices can be obtained from the company.

### Constant Level Valve

The Detroit Lubricator Company, Detroit, Mich., announces a new constant level valve to be supplied with or without a strainer and suitable for application in the oil flow line between storage tank and oil burner.

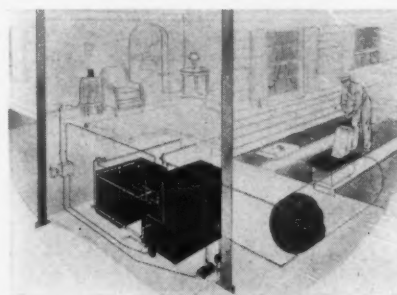
Information and drawings showing the design, application and sizes of the unit have been compiled in the form of a four-page booklet which will be sent to contractors. The booklet also contains prices and tabular matter showing the function of the valve in oil burner installations.

The company also announces a new and unique liquid level gauge for tanks.

### Conditioning Unit

A complete, all-year indoor weather manufacturing plant for homes, which uses ice cooled, electric refrigerated or city tap water for summer cooling, is announced by American Blower Corporation.

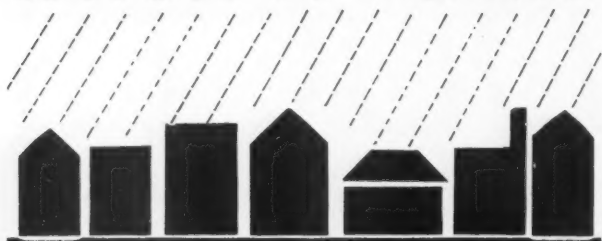
The unit consists of a hot water heating plant and an American Blower Corporation conditioner. The system is known as a warm air type, and the same air ducts which circulate heated air in winter supply the cooled atmos-



phere during summer months. It is equipped with fans which will deliver from 1200 to 4200 cubic feet of warm or cooled air per minute.

Two surface coils are used in both the heating and cooling operations. Hot water is circulated through these finned copper elements in the winter and cooled water is used in summer. After passing through the filter, the air is forced through the two coils and cooled or heated.

*when it rains*



*there is need for a  
working drainage system*

**H U S S E Y**

Every time it rains, you are that much closer to being called in to repair a rusted conductor pipe which has finally given up, to replace an eaves trough or possibly to completely install a new drainage system, with its need for sheet copper in volume.

Your customer is fed up on the constant leaking that goes with these conditions and he wants new reliable equipment at once.

That is a clear specification for

Hussey Sheet Copper or Copper Products. Everything in Copper Products from the smallest item to the entire needs of any job can be furnished promptly from our plant or one of our branch warehouses.

Incidentally the great demand created for Sheet Copper by the return to life of the beer industry is further reason for you to tie up with Hussey. Let Hussey fill your Sheet Copper requirements.

**C. G. HUSSEY & COMPANY  
PITTSBURGH, PENNSYLVANIA**

**DISTRICT SALES OFFICES**

BALTIMORE  
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**WAREHOUSES**

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**MILLS AND EXECUTIVE OFFICE  
PITTSBURGH**

**PERFORATED METALS**

*for*

**EVERY PURPOSE**

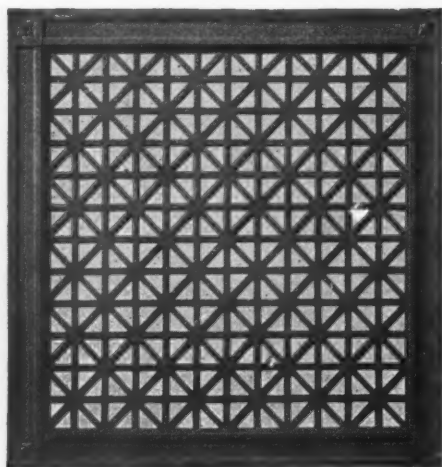
**ARCHITECTURAL GRILLES**

You will find our Grilles in modern Schools, Churches, Public Buildings and Homes. We have many beautiful designs from which to select.

"GRILFRAME" enhances the beauty of any design Grille by the addition of a border frame of steel. Write for detailed information.

**SAFETY GUARDS**—if made from our perforated steel sheets and according to our method are really safe.

**PERFORATED METAL** of every sort for all uses.



*Send us your specifications for  
prices on any kind of Perforated  
Metal.*

**THE HARRINGTON & KING PERFORATING CO.**

5649 FILLMORE ST., CHICAGO, ILL., U. S. A.—NEW YORK OFFICE: 114 LIBERTY ST.



### Peerless Blowers

The Peerless Foundry Company, 1853 Ludlow Ave., Indianapolis, has placed on the market a conditioning unit consisting of a twin wheel blower with belt and motor mounted above a humidifying and diffusing chamber and having the blower wheels covered by a three-faced special filter.

The entire unit is housed in an attractive cabinet and arranged for easy connection with the furnace casing.

The filter material can be purchased by the home owner and replaced by lifting metal bars and inserting the filter material under the bars.

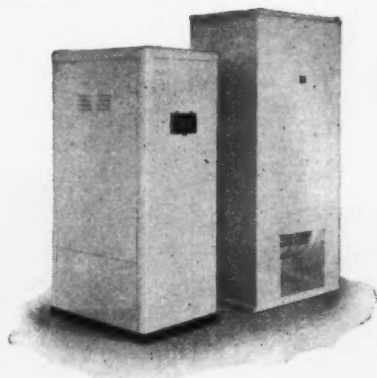
Information and literature descriptive of the unit can be obtained from the Peerless Company.

### CO<sub>2</sub> Recorder

The new Hays CO<sub>2</sub> Recorder-Indicator operates on the accurate Orsat principle. A continuous stream of flue gas is drawn rapidly from the last pass of the boiler. At regular intervals the machine takes a measured sample, causes the CO<sub>2</sub> to be absorbed and the pen to record the amount of the absorption, or in other words, the CO<sub>2</sub> content. At the same time the pointer indicates the percent of CO<sub>2</sub> on a large scale clearly visible at any normal distance.

### New Conditioners

A domestic and a commercial air conditioner consisting of a blower, washer, eliminator plates and filters is announced by the Scott-Ballantyne Co., 916 Redick Tower, Omaha, Nebraska.



The new units will be marketed under the trade name "Magic-Weather."

The illustration shows the residential unit. The commercial unit has the operating parts arranged horizontally one after the other and uses a recirculating pump for the sprays.

Full information and details may be obtained from the company. Literature is also available on either or both units.

### Roofing Nail

A new non-loosening nail especially designed for application of asphalt roll roofings has been perfected by the W. H. Maze Company, Peru, Ill.

The general principle of the nail is a spiral twist which drives the nail in like a screw and serves to hold the nail in the wood. The nail is being manufactured in lengths of 7/8-inch, 1-inch and 1 1/4-inches and is supplied in 5-pound cartons or kegs.

Descriptive literature of the new product has been prepared and will be supplied to contractors.

### Humidity Fittings

A line of humidity fittings including Kwiklok, a fitting for attaching the humidity line to the water service pipe; Kwikturn, a shut-off valve suitable for connection to humidity equipment tubing; and Kwikleen, a fine mesh, self-supporting filter which catches dirt before it gets in the humidity line, is being manufactured for and distributed in Cleveland by Walter J. Ottinger, 1929 East 55th St.

A four-page letter showing illustrations of the fittings together with information on prices, delivery and proper installation has been prepared and will be sent to contractors.

## NOW THEY ARE READY TO BUY!

The tide has turned. Get ready to supply the demand for new furnaces which has been pent up for the last three years. With the fully complete line of Moncrief Furnaces, cast and

steel in all types and sizes, you can fill every need for efficient, economical home heating. Moncrief gas furnaces and air conditioners are up-to-the-minute in design and construction.

*Get in touch with the distributor nearest you or write direct for interesting new literature.*

### THE HENRY FURNACE & FOUNDRY CO.

3471 E. 49th St.

Cleveland, Ohio

Eastern Office, E. L. Garner, Mgr.

224 No. 23d Street, Philadelphia, Pa.

Branches at Pittsburgh, Pa., and Ashtabula, Ohio

Pacific Coast Representative

McPherson Furnace & Supply Co., Portland, Oregon

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Chicago Furnace Supply Co.,

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Geo. H. Cole Supply Co.,

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Sheet Metal Supply Co.,

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Northern Metal & Mfg. Co.,

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Schrader-Easley Co.,

Memphis, Tenn.

Marshall-Wells Co.,

Duluth, Minn.

Roberts-Hamilton Co.,

Minneapolis, Minn.

The Behler-Young Co.,

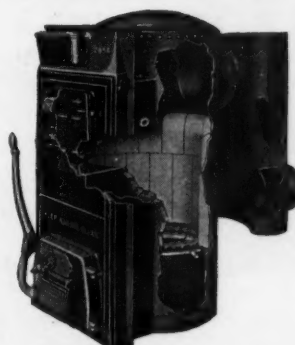
Grand Rapids, Mich.

Moncrief Heating Co.,

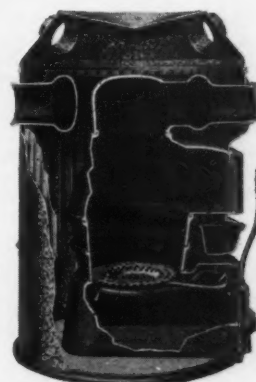
South Bend, Ind.

Moncrief Heating Co.,

Youngstown, Ohio



*Cut-away View of the Series "S" Steel Furnace*

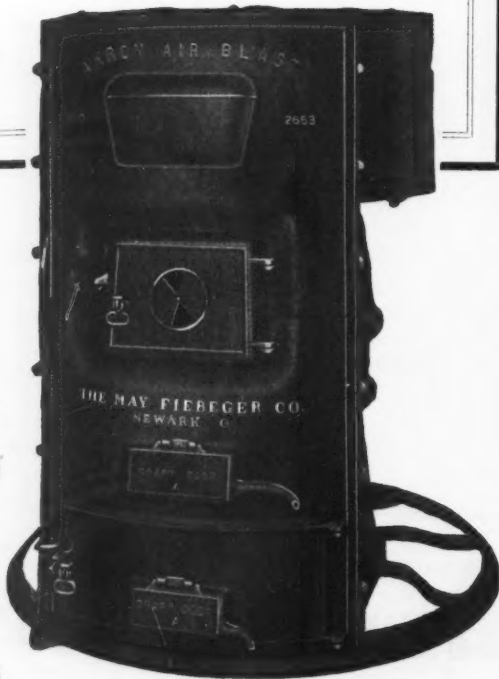


*Sectional View of the Series "C" Cast Furnace*

# MONCRIEF FURNACES

## FOR FORTY-THREE YEARS

**The  
AKRON  
Air Blast**



» » **F**OR 43 years the Akron Air Blast has been a model of efficiency in the matter of economical heating. This condition has been brought about primarily by the radiator in the Akron Air Blast, which is made with cast iron top and bottom plates — Armco iron body and tubes. Tubular construction affords maximum of radiator surface exposed to the fire on the inside and the air on the outside, insuring greatest amount of heated air possible and fastest circulation.

The Three-Way Air Blast maintains the same high standard of efficiency. Air taken through the draft opening is delivered, one-third under the fire and two-thirds over the top of the fire, effecting practically perfect combustion. The

air delivered under the fire causes the fire to burn and releases gases from the coal. The other air is mixed with gases from the coal in the combustion chamber and radiator above the fire and all are consumed.

Greater heating surface is not merely something to talk about in the Akron. It is an absolute fact. It is so proportioned that it represents the largest amount of heating surface per square foot of grate surface, and is another reason why the Akron Air Blast has been a leader in the warm air heating field for the past 43 years.

Write for the Akron Air Blast story. Also get particulars on the Ath-A-Nor and the Solid Comfort, other leaders in an outstanding line of furnaces.

**THE MAY-FIEBEGER CO., NEWARK, OHIO**  
*Everything for the Warm Air Heating Trade*

**A K R O N**  
**A i r B l a s t**

## With Our Readers . . . . .

### What They Look Like in Virgin Islands

One of our readers, Charles Tisch, Jr., of Charles Tisch, Inc., Brooklyn, N. Y., mailed us the photograph shown while on a visit to St. Thomas in the Virgin Islands. He snapped the picture to show friends what sheet metal shops look like in the islands. He calls attention to the condition of the roof and inquires if this isn't typical of a too-large proportion of shops in this country. "When it



rains we can't work; when it's dry we don't need to fix the roof," might apply.

What the significance of the signs "Cafe" and "Iced Drinks" is, Mr. Tisch doesn't know, but says they were probably put up by a former occupant and never taken down. Perhaps contractors there don't believe in advertising and window display.

### Chicago Association to Picnic in July

The Furnace and Sheet Metal Institute of Chicago will hold its 2nd annual picnic on Thursday, July 20th, at Long Lake Park, Long Lake, Ill. All plans for the picnic have been completed and Jack Weiner, President of the association, promises that the same kind of a good time that was enjoyed last year will be waiting.

### William Off Dies

William "Bill" Off, one of Indiana's long-time furnace and sheet metal contractors, died this month after a long illness. Mr. Off had been in business with his brother for over fifty years.

### Death of Herbert I. Lord

Herbert I. Lord died May 25th in Detroit after a long and constructive career in the heating industry.

Educated at the Massachusetts Institute of Technology, he joined the sales force of the American Radiator Company in Boston and was later transferred to Chicago. Subsequently, Mr. Lord became First Vice President of Detroit Lubricator Company, which is one of the important subsidiary companies of the American Radiator & Standard Sanitary Corporation.

Mr. Lord's keen interest in the industry made for him a host of warm friends who will feel the loss of his constructive force and sympathetic helpfulness.

*There's  
money  
IN  
every  
can of*

*"370 SPECIAL RED"*

**T**HE profit possibilities of "370 SPECIAL RED" are bounded only by the number of sheet metal roofs in your community. These roofs must be painted regularly if they are to continue to protect the buildings they cover.

Paint them with "370 SPECIAL RED," a heavy bodied Red Oxide Paint designed for tanners and roofers, which offers long time protection to metal surfaces exposed to the elements. Made of Pure Red Lead, Spanish Sesqui-Oxide of Iron and highest grade Raw and Boiled Linseed Oil.

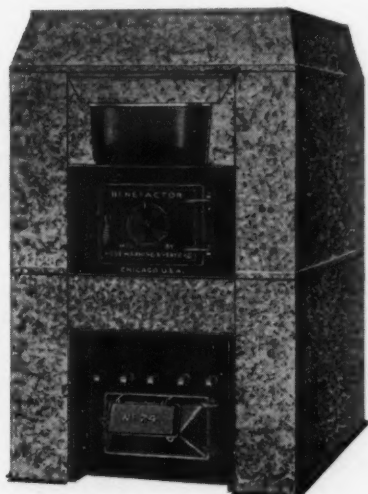
Write for full information and literature on other Thompson paints.



**THOMPSON & CO.**  
P. O. Box 557, N. S., Pittsburgh, Pa.

## PRICED TO SELL

HESS  
LOW PRICES  
AND  
HIGH QUALITY  
WILL  
INCREASE  
YOUR  
SALES  
AND  
PROFITS



Quality Steel Benefactor Furnace Is Offered at a Low Cast Iron Price. See Hess Exhibit at Home Planning Hall—at World's Fair. Write Today for Dealer Portfolio of Furnace and Air Conditioner.

**HESS WARMING & VENTILATING CO.**  
1201-1211 SO. WESTERN AVE. CHICAGO, ILL.



## FOR VENTILATING WORK

Right now, is the time when your prospects really think more about ventilating than at any other time in the year.

The time for you to profit by ventilating work then, is NOW. Work out your sales campaign, and go after your prospects. Tell your story and you will find there is ventilating business for the aggressive dealer. And as an added suggestion,

include the Viking Shear in your ventilating work. The Viking Shear really backs up

our claim of "the perfect shear for ventilating work."

Strong and sturdy, built of only the finest materials, the Viking will ac-

complish its tasks in the shortest possible time, and incidentally, you always profit on this labor saving. Send for particulars.

## THE VIKING SHEAR

**VIKING SHEAR CO., ERIE, PA.**

## You can do the job better with NEVER-SLIP CONDUCTOR HOOKS

Never-Slip, the Conductor Hook without a fault, made of Malleable Iron to withstand heavy usage and constructed so as to hold both round and corrugated pipe firmly without fear of slipping loose.



Write for  
Price List



## MINNEMEYER CONDUCTOR FASTENERS offer convenience

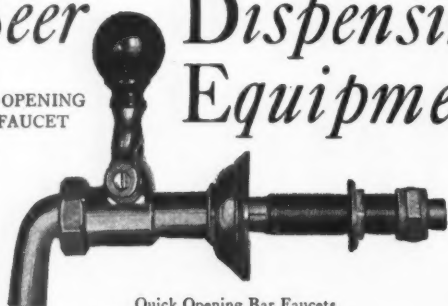
Minnemeyer fasteners hold the pipe one inch from the building leaving room for painting around the back of the pipe and for later repairs to the conductor pipe.

**LA CROSSE STEEL ROOFING  
& CORRUGATING COMPANY**  
LA CROSSE WISCONSIN



## Complete Line of Beer Dispensing Equipment

QUICK OPENING  
BAR FAUCET



Quick Opening Bar Faucets  
Draught Tubes and Tapping Bungs  
Couplings for Faucets and Tubes  
Distributing Pipes  
Regular Brass Air Cocks  
Water Stop Cocks  
Connections  
Overflows and Sockets  
Tank Fittings  
Ice Box Couplings  
Brass Gauge and Regulator Arms  
Beer Pipe Cleaner Couplings  
Beer Pipe Cleaners

A most complete line of beer dispensing equipment is now available to the metal worker priced so as to attract business and yet allow a substantial profit.

Backed by 81 years of experience in building brass goods, the Farnan line will meet your every need.

**THE FARNAN BRASS WORKS CO.**  
Manufacturers of High Grade Brass Products

Established in 1852

1104 Center St., N. W.

Cleveland, Ohio

## BEER FAUCETS

for  
immediate delivery

**THE GLOBE BRASS MFG. CO.**  
2925 E. 55th St. CLEVELAND, OHIO

## SALESMEN WANTED!

Commission salesmen can make large immediate profits and build a very substantial permanent business handling Beer Dispensing Equipment.

The great demand for Bars, Beer Coolers, Beer Pumps, Beer Brass, and Electric Beer Dispensing units has only started. Much of the equipment installed in the first rush, to get ready, will soon be discarded for better and more efficient equipment.

Write us at once giving full particulars regarding your qualifications and an outline of territory covered. **Address Key 239, "AMERICAN ARTISAN"**

1900 Prairie Ave., Chicago

## News Items

### Hart & Cooley—Tuttle & Bailey Combine

Announcement is made of the consolidation of the business of Tuttle & Bailey Manufacturing Company of Brooklyn, New York and Fort Erie North, Ontario, Canada, and Hart & Cooley Manufacturing Company of Chicago, Illinois and New Britain, Connecticut.

In the future the leading register items manufactured by Tuttle & Bailey will be produced by Hart & Cooley. Sales headquarters on the consolidated register lines will be Hart & Cooley's main sales office at 61 West Kinzie Street, Chicago.

The prestige of the Tuttle and Bailey name in the field of special ornamental grilles will be maintained by consolidating the grille lines of the two manufacturers under the name of Tuttle & Bailey, Inc., with main sales offices in New Britain, Connecticut. Branch offices at Chicago, New York, Boston, Philadelphia and Kansas City, and special grille representatives throughout the country, will be maintained as heretofore.

### Kurfess Advanced by Ryerson

W. F. Kurfess, Manager of the Mill Department of Joseph T. Ryerson & Son, Inc., has been appointed Assistant Vice-President of the Company.

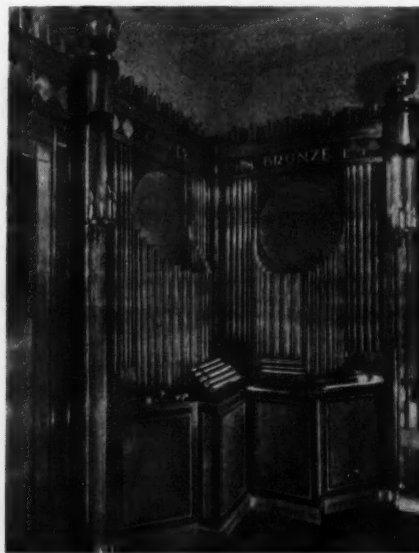
M. J. Hartigan succeeds Mr. Kurfess as Manager of the Mill Department.

Mr. Kurfess entered the Structural Engineering Department of the Ryerson Company in 1912 and has held many positions leading up to his present responsibility.

### Copper & Brass at Chicago Fair

The illustration shows a section of the exhibition of the Copper & Brass Research Association at the forthcoming Century of Progress Exposition in Chicago.

The exhibition, intended to demonstrate the develop-



ment of the industry in the last 100 years, will feature a number of new alloys and forms of Copper, Brass and Bronze which have been produced after extensive research. Among the alloys are some which have high tensile strength and are at the same time corrosion-resistant. Also will be shown chromium plated copper, lead-coated copper and copper on which patina (green) has been developed by artificial means.

## News Items . . . . .

### Burner Men Adopt Recovery Code

With a substantial majority of the industry's responsible manufacturers represented, an oil burner manufacturers' conference on June 15 in Chicago unanimously approved an all-industry recovery code and empowered the directorate of the American Oil Burner Association to present the recommended code to President Roosevelt under the terms of the administration's National Industrial Recovery Act.

The dealer division of the American Oil Burner Association, comprising a membership of 2,000, also acted and approved the measure unanimously, it was announced.

### American Tinsmith Supply Company

Morris Zaslawsky has opened the American Tinsmith Supply Company, 389 Atlantic Avenue, Brooklyn, N. Y. Supplies and machinery will be carried in stock. Contract work will also be done.

### Railroads Reduce Rates on Furnaces

Effective April 1, 1933, freight rates on furnaces and steam and hot water radiation were reduced from third to fourth class in less carload lots in all territory east of the Mississippi river and north of the Ohio river and the line through Washington, D. C.

This means a reduction of more than 25% in shipping costs and will no doubt bring back to the railroads their proportion of this traffic which has been going to the truck lines in such increasing volume during the past two or three years.

### Miniature Glass Plant at Fair

Included in the exhibit of the Owens-Illinois Glass Company of Toledo, in its glass-block building at A Century of Progress, Chicago, is an elaborate animated model of a complete glass plant in operation. This intricate display was worked out in realistic perspective and with life-like carved models by T. K. Almroth, Advertising Manager of the company, and built under his supervision.

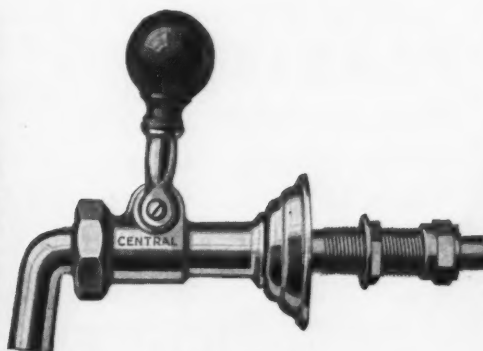
### Dresser Buys Bryant Heater

S. R. Dresser Mfg. Co. announces the purchase of The Bryant Heater & Mfg. Co. as of June 15.

S. R. Dresser Mfg. Co. has been identified with the gas industry for fifty years through its manufacture and supply of pipe couplings, clamps, and other pipe line accessories.

The entire Dresser resources and facilities have been placed at the disposal of The Bryant Heater & Mfg. Co. and new phases of laboratory and marketing work will be immediately inaugurated. New products and improvements are under way and others will follow as fast as manufacturing and marketing conditions are ready.

A part of the organization of Dresser will take charge of The Bryant Heater & Mfg. Co. F. A. Miller and H. N. Mallon, chairman and president, respectively, of the Dresser company, have similar responsibilities in the Bryant company. L. C. Harvey, at present sales manager of The Bryant Heater & Mfg. Co., is vice president in charge of sales. E. P. Bailey, Jr., returns to Bryant after an absence of three years and becomes vice president in charge of operations.



## Quality in BEER FAUCETS Is Important!

THE stress and strain of bar operation come mainly on the *working parts*, such as faucets. Make sure your faucets are made by experts—and by reliable experts, who will not sacrifice quality to mere *quick delivery*. Central Beer Faucets are heavy-duty, fine quality fittings and have passed severe tests in the engineering departments of prominent bar builders. It will pay you, in the long run, to use Central.

If interested in strictly high grade beer faucets, self-closing water faucets, and work board faucets, you are invited to write for Central Catalog B. Central products are sold through manufacturers and jobbers.

CENTRAL BRASS MFG. CO.

2953 East 55th St., Cleveland, Ohio

# CENTRAL

• *Quality Fittings* •

# BEER Fittings

Air Distributors	Register Cocks with
Bar Faucets	Hex Nut and Hose
Brass Bung with	Nipple
Check Valve	Angle Beer Nipples
Bung Wrenches	Tee Fittings for 5/16"
Brass Air Cocks	Hose
Draught Tubes for	Unions
Half Barrel	Faucet Couplings
Draught Tubes for	"Y" Branches
Whole Barrel	Rod Elbows
Draught Tube Cocks	Washout Nipples
with Wing Union	Box Connections—2",
Nut and Hose	3", 4"
Nipple	

Write for illustrated folder  
giving TYPES, SIZES, etc.

We distribute through Plumbing  
Jobbers and Wholesalers

## KITSON CO.

WESTMORELAND & STOKLEY STS.  
PHILADELPHIA PA.

**"FABRIKATED"**

**COLD AIR FACES**

**Floor Registers**

**Forced Air Registers**

**82%  
OPEN  
AREA**

**ANY SIZE . . . ANY FINISH**

*May we send Catalogue?*

**INDEPENDENT**

**INDEPENDENT REGISTER & MFG. CO.**  
3741 East 93rd Street . . . Cleveland, Ohio

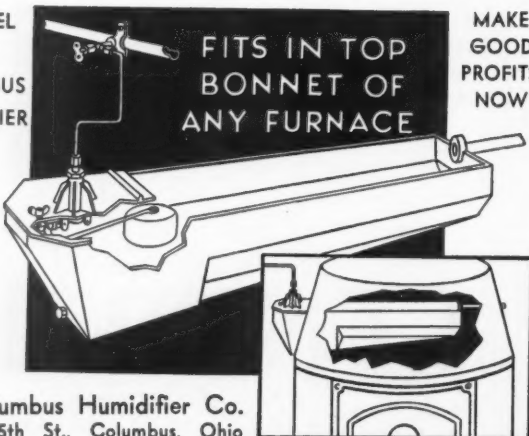
MODEL  
"C"  
COLUMBUS  
HUMIDIFIER

**FITS IN TOP  
BONNET OF  
ANY FURNACE**

MAKE  
GOOD  
PROFITS  
NOW

Dealers  
Write  
Today

The Columbus Humidifier Co.  
154 N. 5th St., Columbus, Ohio



**S**EE at the Chicago Century of Progress, the Sunbeam Air Conditioning Unit equipped with a mechanical cooling unit in operation at the American Radiator & Standard Sanitary Corporation Building. See also the Sunbeam Air Conditioning System completely installed and in operation, at the Good Housekeeping—Stran-Steel Model House.

THE FOX FURNACE COMPANY, Elyria, Ohio

**SUNBEAM**  
WARM AIR FURNACES AND  
AIR CONDITIONING UNITS

### Sell Furnace Repairs and Make Money



**Breuer Electric Mfg. Co.**  
865 Blackhawk Street, Chicago, Ill.

### with Breuer's Ball Bearing **TORNADO** Furnace Cleaning Service

The TORNADO gets you into the basement where it is easy to sell repairs and new furnaces. And you make a profit on the cleaning job too. Hundreds of dealers say the TORNADO increased business beyond all expectations. We'll send you on request the name and statement of a dealer near you to prove our claims.

The TORNADO is the most powerful portable furnace cleaner built. Complete with 10 necessary attachments. Low price—easy payments—free trial. Approved by Anthracite Institute and Underwriters' Laboratories. Write for complete information on a real money maker.

## News Items . . . . .

### Ohio State Convention

Announcement is made that the 1933 annual meeting of the Ohio Sheet Metal Contractors Association will be held July 18, 19 and 20 at Cedar Point-on-Lake Erie, a few miles from Sandusky.

The convention committee, Carl M. Gundlach, chairman, 910 Columbus Ave., Sandusky, will be glad to furnish complete information on vacation costs for a combination picnic and convention. The official meeting place will be Hotel Breakers.

### Milcor Buys Lamneck Products

The Milcor Steel Company announces the purchase of the Stove Pipe and Elbow Department of the Lamneck Products Company, Columbus, Ohio.

Equipment of these divisions will be absorbed by the Milcor factory at Canton, Ohio, and the Milwaukee plant. It will enable much greater production of Milcor stove pipe and elbows.

This is the second expansion which the Milcor Steel Company has made in the past few months. The Richsto Metal Trim Company of Illinois was taken over in February.

### Change Roof Surety

Building owners, architects and roofing contractors, all over the country, will receive shortly a letter announcing that Koppers Products Company, Pittsburgh, will deliver to all holders of bonds issued on Koppers Bonded Roofs and Flashing bonds with a new surety, because of the insolvency of the former surety.

Says J. N. Forker, President of Koppers Products Company.—"Letters have been sent to every building owner, architect and roofing contractor affected, stating that we have voluntarily arranged to have new bonds, under identical terms and conditions, issued immediately with another surety company. All that holders of bonds issued on Koppers Bonded Roofs and Flashing need do is return the bonds now in their possession and we will exchange them for new bonds."

### Sunbeam at Century of Progress

Heating contractors, architects, builders and others interested in residential construction and the equipment will gravitate to the model housing group at the Century of Progress to be held at Chicago, June 1st to November 1st.

Of particular interest to the heating fraternity is the Good Housekeeping sponsored model house which has been erected by the Stran-Steel Corporation of Detroit, Michigan.

Exterior walls are made of metal, finished in an attractive ivory-toned baked enamel. Metal framing is employed throughout the house.

Sharing honors with the building is the Sunbeam Air Conditioning System which has been selected to maintain perfect air conditions in this model house.

An unusual feature of the installation is the placing of the heater room on the first floor. The warm air ducts rise from the unit to the heater room ceiling, pass along the ceiling joists and then drop down the stud spaces to the floor level where the registers are placed. The recirculating air is drawn upward through the stud spaces, across the ceiling and drops down into the blower compartment.



## New Literature . . . .

### Silentair Conditioning Equipment

A. Gehri & Company, Syracuse, N. Y., and Tacoma, Wash., have issued a new catalog showing the improved Silentair conditioners, blowers, washers, filter cabinets, and unpowered blowers.

The catalog also contains descriptive material on accessories handled by the company or used in connection with their equipment.

This catalog describes the improved units that are manufactured by the company such as the Deluxe conditioner, the combination blower and washer, and the Junior conditioner. Each unit is shown by illustration and complete data of sizes, capacities and performance records are shown with each unit.

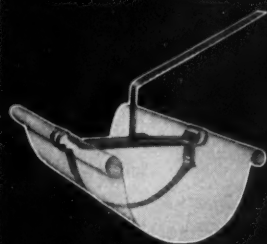
The company has also prepared a revised dealer discount list. Copies of the list and the catalog may be obtained by writing the company at either office.

### Figuring Welding Costs

"How to Figure Oxwelding and Cutting Costs," an 8 page, 8½x11 booklet with illustrations and tables has been published by The Linde Air Products Company, New York.

This publication will prove of particular value for those who wish to set up methods of figuring oxwelding and cutting costs best suited to their particular needs. Three different methods for computing material consumption, and the conditions under which each should be used, are presented in tabular form for ready reference. Examples are given to explain each method.

## "BB" Quality



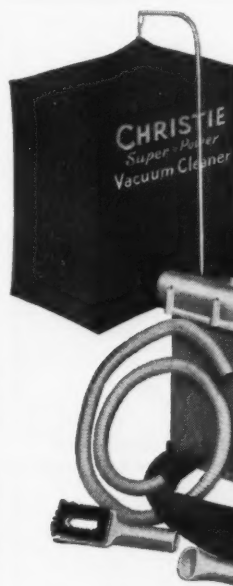
'THE RIVAL'  
STRAP HANGER  
for single bead and  
double bead gutter

**Build up a reputation  
with "BB" Products**  
CARRIED BY LEADING JOBBERS EVERYWHERE

Eaves Trough  
Conductor Pipe  
Conductor Fasteners  
Mitres  
End Pieces and Caps  
Conductor Heads  
Ornamental Straps  
Ventilators, etc.

**BERGER BROTHERS  
COMPANY**

229-237 Arch St. Philadelphia, Pa.



## CHRISTIE FURNACE VACUUM CLEANER

A One-Man  
Super Powered  
Machine

New Low Price

**\$99<sup>50</sup>**

F. O. B. Cincinnati  
with Tools and Attachments.

This is the same high quality machine that is known to furnace dealers everywhere as the most powerful, one-man cleaner on the market. Built by practical furnace men.

Quantity production and large purchasing power enable us to make this sensationally low price. Includes tools and attachments. Price subject to change without notice.

We also manufacture the "Christie Giant" to meet the requirements of those who wish to operate from truck or yard.

Folder "A" mailed upon request.

## CHRISTIE CLEANER COMPANY

Division of The Cincinnati Sheet Metal & Roofing Co.  
226-30 Front St. Cincinnati, Ohio

## WHITNEY LEVER PUNCHES

### No. 4B PUNCH



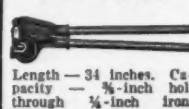
Length—8½ inches. Capacity ¼-inch through 16 gauge. Deep Throat—2 inches. Weight—3 pounds. Punches and Dies—¾" to ⅝" by 64ths.

### No. 91 PUNCH



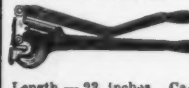
Capacity — ¼-inch hole through ¼-inch, 1-inch hole through ⅝-inch and 2-inch hole through ¾-inch iron. Depth throat 5-inches. Weight — 82 lbs.

### No. 1 PUNCH



Length—34 inches. Capacity — ¾-inch hole through ¼-inch iron. Punches and dies in sizes from ¼ to ⅝ by 64ths.

### No. 2 PUNCH



Length—23 inches. Capacity — ¾-inch hole through ¼-inch iron. Punches and dies in sizes ⅝-inch to ¾-inch by 64ths.

### CHANNEL IRON PUNCH



Companion to No. 2 Punch. Every part of the two Punches interchangeable, including punches and dies. Capacity — ¼-inch hole through ¼-inch iron.

### No. 6 PUNCH



Length—26½ inches. Capacity — ¾-inch hole through ⅝-inch iron; especially adapted for button punching or templet work. Punches and dies ⅝" to ⅝" by 32nds.

We have tools for every purpose needed by Sheet Metal Contractors.

Ask your Jobber



**WHITNEY MFG. CO.**  
636 RACE ST. ROCKFORD, ILL.

## THE MEYER FURNACE COMPANY PEORIA, ILLINOIS

Manufacturers of

WEIR Furnaces  
WEIR DeLuxe Units  
WEIR Conditioned Air Units

The MEYER Gas Fired Air Conditioner  
The MEYER Washed Air Conditioner  
The MEYER Fan-Filter

Ask for a copy of our new "Book of Facts" and "Conditioned Air Portfolio."



The  
**ALLEN**  
MULTI  
VANE

**TURBINE  
VENTILATOR**

Exclusive inner Multi-Vane construction assures unparalleled results.

**THE ALLEN  
CORPORATION**  
1036 1/2 14th Street  
DETROIT, MICH.

## BELLEVUE STRATFORD



Mention Philadelphia to world travellers and they'll say—"Bellevue-Stratford". This famous hotel has always attracted those who appreciate the finer things of life; those whose experience has taught them where to find facilities, comforts and services in the fullest measure.

CLAUDE H. BENNETT, Gen'l Mgr.

Rates consistent with present times.

## New Literature . . . .

### Waterproofing Booklet

The American Brass Company, Waterbury, Conn., has issued an illustrated booklet describing and showing the application of the company's new "thin" copper sheet to the water proofing of floors, foundations, structural members, masonry belt courses, etc.

Each of the special applications is taken up in detail and full explanation with illustrations are given. In addition, a sample, page size, of one weight of the new thin copper sheet is enclosed in the booklet.

A copy of the booklet will be supplied to any contractor doing water-proofing or sheet metal work.

### Inland Steel Booklet

The Inland Steel Company, Chicago, has just published a new booklet describing the history of the development of the company in the central west.

Contractors who follow sheet manufacture and descriptions of production processes will be interested in this book which describes in detail the manufacture of sheets and illustrates most of the operations with special photographs.

The booklet is made up in modernistic design. In addition to describing manufacturing the book also points out and illustrates various applications of sheet metal.

Copies of the booklet can be obtained by writing the company.

### Air Conditioning for Profit

An illustrated publication entitled "Air Conditioning for Health, Comfort and Profit" has been published by Westinghouse Electric & Manufacturing Company, Pittsburgh.

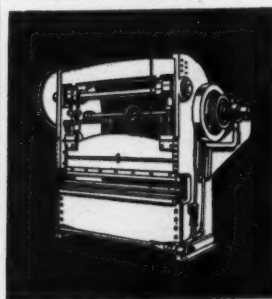
The booklet describes the Westinghouse unit conditioner, shows illustrations and gives data on the various units, gives problems and the solutions and outlines the fields which can be conditioned with the units.

Readers may secure copy by writing the company.

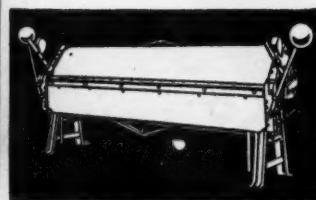
### Price List

The Abbott Manufacturing Company, Painesville, Ohio, is mailing out a new price list covering their line of Peerless eave trough hangers.

Copy of the price list will be mailed to any contractor who has not already received one.



PRESS BRAKE



HAND BENDING BRAKE

Steel Brakes—Presses—Shears

**DREIS & KRUMP MFG. CO.**  
7404 LOOMIS BLVD. CHICAGO

# CLASSIFIED ADVERTISING

4 cents for each word including heading and address. Count seven words for keyed address. Minimum \$1.00 for each insertion. One inch \$3.00. Cash must accompany order. Copy should reach us eight days in advance of publication date.

## BUSINESS CHANCES

### LIGHTNING RODS

Dealers who are selling Lightning Protection will make money by writing to us for our latest Factory to Dealer Prices. We employ no salesmen and save you all overhead charges. Our Pure Copper Cable and Fixtures are endorsed by the National Board of Fire Underwriters and hundreds of dealers. Write today for samples and prices. Address L. K. Diddle Company, Marshfield, Wis.

## SITUATIONS OPEN

### Salesman Wanted

Regularly calling on Furnace Dealers to sell a line of automatic damper and air conditioning controls for domestic installations, on a liberal commission basis. Old established manufacturer. Address Key 240, "American Artisan," 1900 Prairie Ave., Chicago, Ill.

EXPERIENCED TRAVELING SALESMAN wanted. Must be experienced in forced air and gravity heating. Address Key 243, "American Artisan," 1900 Prairie Ave., Chicago, Ill.

WANTED: MANUFACTURERS' AGENTS in position to handle beer dispensing equipment on commission basis. Address Key 242, "American Artisan," 1900 Prairie Ave., Chicago, Ill.

## SITUATIONS WANTED

WANTED, SITUATION: TRAVELING Chicago area. Sheet Metals and Metal products, or manufacturers' agent, or inside work. Wm. C. Allen, 566 Newton Ave., Glen Ellyn, Ill. Phone 528.

SITUATION WANTED BY A FIRST class sheet metal worker and warm air furnace man. I can make cornices, skylights, ventilation of all kinds. Especially good at job work; also a good roofer, slate, tile, tin and built-up roofing. Can do some plumbing. Can read blue prints and draft all kinds of patterns. I can also furnish references. Edward Collins, 82 Currier St., N. E., Atlanta, Georgia.

SITUATION WANTED—A FIRST CLASS tinner and plumber, steam and hot water fitter. Can do all kinds of repair work, radiator and pump repairing. Wants to rent or run shop on commission. Address Key 238, "American Artisan," 1900 Prairie Avenue, Chicago, Illinois.

## Situation Wanted

Furnace salesman and heating engineer of broad acquaintance and experience in the sale of all types of gravity, forced air, coal and gas fired and trunk-line systems, desires connection with progressive manufacturer. Will consider any territory. Thirty-nine years of age, married, a college education, served eight years as Ohio representative for one of the largest furnace manufacturers, unusual record of sales accomplishment, A-1 references. Address Key 244, "American Artisan," 1900 Prairie Ave., Chicago, Ill.

WANTED: POSITION AS TINNER AND plumber. Have state license. An expert hot air furnace worker; also back bar and brewery work. Steady, sober, good habits. Good references. Address Key 229, "American Artisan," 1900 Prairie Ave., Chicago, Ill.

FIRST CLASS, THOROUGHLY EXPERIENCED, practical roofing and sheet metal estimator desires connection with a substantial concern. Address Key 230, "American Artisan," 1900 Prairie Avenue, Chicago, Illinois.

TRAINED AND EXPERIENCED MECHANIC wishes position in first class sheet metal shop. Can design, lay-out, build and erect most any sheet metal, hard shingle and tile roofing job that comes along. Especially experienced in cornice, skylight, window and door work, gutters, ventilating, etc., on churches, schools, residences, etc., in metals as iron, copper, aluminum, zinc, stainless steels, etc. Will gladly furnish references upon request. Address Key 232, "American Artisan," 1900 Prairie Avenue, Chicago, Illinois.

SITUATION WANTED—SHEET METAL worker first class, twenty years' experience, A No. 1 lay-out man and estimator. Am a registered plumber and first class lead worker, fully experienced in all heating, large and small jobs as well. I was foreman on three government jobs, factory trained in Oxy-Acetylene welding, best of references. Will take a shop on percentage. Good salesman, honest, sober. Will go anywhere, prefer the east. Address Key 235, "American Artisan," 1900 Prairie Avenue, Chicago, Illinois.

SITUATION WANTED—BY AN EXPERIENCED tinner, plumber and hardware clerk. Small town no objection. Will work on salary or operate shop on percentage basis. Have operated shop for myself for 16 years. Central west, Pacific coast or Colorado preferred. Address Key 222, "American Artisan," 1900 Prairie Avenue, Chicago, Ill.

SITUATION WANTED: PLUMBER AND sheet metal man, with fifteen years' experience, now open for a steady place. What have you to offer? Address Key 228, "American Artisan," 1900 Prairie Ave., Chicago, Ill.

## LINES TO HANDLE

WANTED: COMMISSION REPRESENTATIVES by manufacturer of beer coolers, beer pumps and complete beer dispensing units. In answering, give territory covered and names of lines now handled. Address Key 241, "American Artisan," 1900 Prairie Ave., Chicago, Ill.

## WANTED TO BUY

WANTED: A MAPLEWOOD ELBOW machine. The Baker Furnace & Cleaner Mfg. Co., 2505 Albion St., Toledo, Ohio.

WANTED—A TEN FOOT CORNICE Brake. Must be in good condition. J. V. Patten Company, Sycamore, Illinois.

WANTED—BY FIRST CLASS MASTER plumber and steamfitter, can also do sheet metal work, a shop to run on commission basis or a Service-at-your-Door Truck. Will furnish truck and set of tools where town and conditions will warrant it. Must be in Illinois. Address Key 234, "American Artisan," 1900 Prairie Avenue, Chicago, Illinois.

## FOR SALE

### Bargains

Arc Welding Demonstrators. Guaranteed Profit Makers. Electric, Gasoline Engine, Belted. 30 Days' Trial, terms. Hobart Brothers, Used Equipment Division, Box RT73, Troy, Ohio.

FOR SALE—IN WISCONSIN CITY OF 4,000, first class sheet metal and heating shop. Price right. Rent reasonable. Address Key 231, "American Artisan," 1900 Prairie Avenue, Chicago, Illinois.

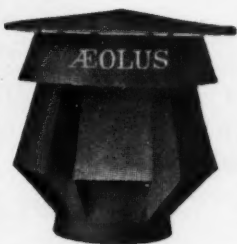
FOR SALE—ONE COMPLETE SET OF tinner's tools and stock, with or without shop. Residence and garage. Business has been established eleven years. Address Key 236, "American Artisan," 1900 Prairie Avenue, Chicago, Illinois.

## MISCELLANEOUS

### Patents and Trade Marks

Philip V. W. Peck  
Barrister Bldg., Washington, D. C.

Install



**ÆOLUS**  
Improved  
**VENTILATORS**

FOR industrial buildings, schools, homes, theaters, etc. Made in 14 different metals. Constant ventilation—no noise—no upkeep.

ÆOLUS DICKINSON  
Industrial Division of Paul Dickinson, Inc.

3332-52 South Artesian Avenue  
Chicago, Ill.

## FURNACE & BOILER REPAIRS

GRATE BARS AND RESTS, FIRE POTS, FEED SECTIONS, FIRE BRICK, ETC.

IN STOCK . . . READY FOR IMMEDIATE SHIPMENT

**A. G. BRAUER SUPPLY CO.**  
312-18 NO. THIRD ST. . . ST. LOUIS.



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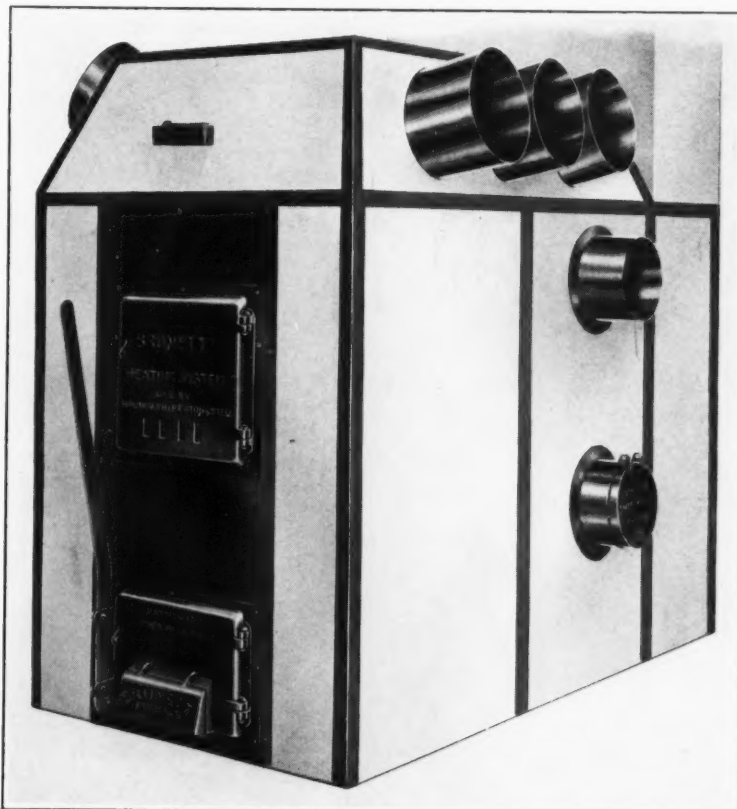
*For Complete Lists of Furnace, Sheet Metal and Air Conditioning Products and Sources of Supply Consult AMERICAN ARTISAN ANNUAL DIRECTORY NUMBER*

AMERICAN ARTISAN

# YOUR FUTURE SUCCESS DEPENDS UPON TODAY'S OPPORTUNITIES

## *The BRUNETT "Dual" Warm Air Heating System*

◆  
ALL  
WELDED  
STEEL  
CONSTRUCTION  
◆



THE ONLY  
FURNACE  
MADE WITH  
A  
PATENTED  
BRUNETT  
HEAT  
UTILIZER

THIS Unit gives you an opportunity to get in on the ground floor of a new heating business, and make yourself a nice profit this year.

The Brunett "Dual" Warm Air Heating System, with its Patented Heat Utilizer produces 91.707% efficiency, which results in a huge fuel saving to your cus-

tomers, and makes it easy for you to sell.

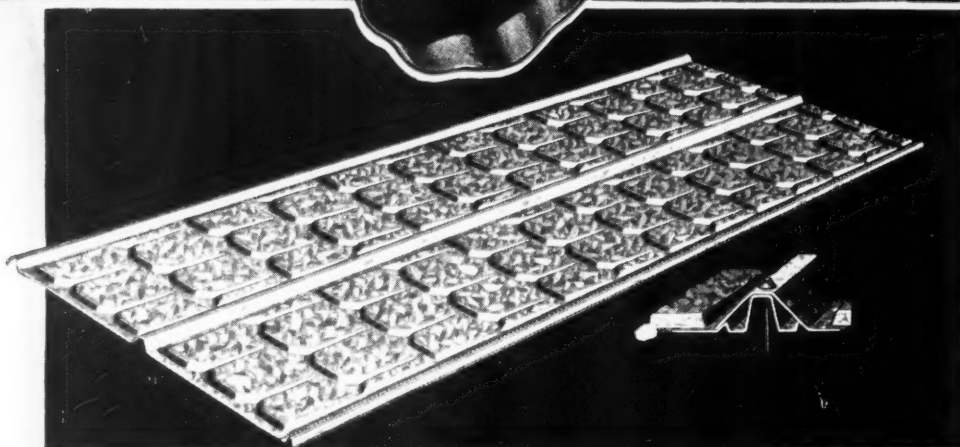
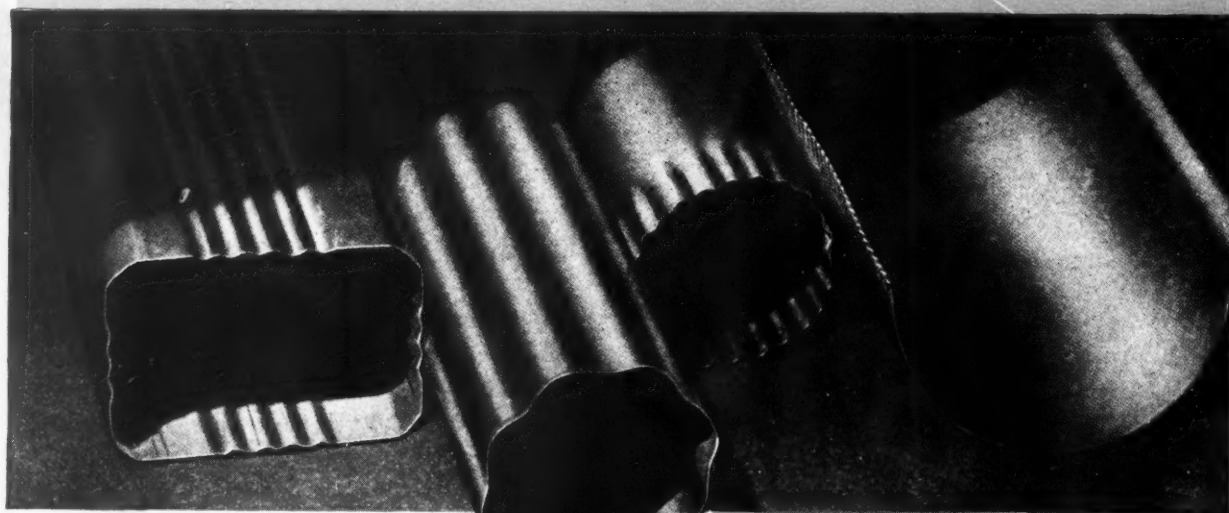
You can sell the Brunett Patented Heat Utilizer separately on jobs where present heating systems are wasting fuel. It will make a saving of 25 to 60%. A size for every building and home—from the largest to the smallest.

WRITE TODAY FOR INFORMATION

### BROWN SHEET IRON & STEEL COMPANY

◆ Pioneer Welders of the Northwest ◆

BUILDERS OF THE WORLD'S LARGEST ONE UNIT WARM AIR FURNACES  
964 BERRY AVENUE SAINT PAUL, MINNESOTA



*Architectural Ornaments*

*Metal Ceilings*

*Ventilators and Skylights*

*Stove Pipe and Elbows*

*Furnace Pipe and Fittings*



*Rain Carrying Equipment*

*Roofing and Roof Trimmings*

*Spanish and American Tile*

*Twodrain Channel Roofing*

*Sheets and Siding*

## Milcor Products are the Raw Material of Your Success

Full measure - - full weight - - the sort of dependable materials which result in thoroughly satisfied customers - - the sort of materials you can work with best and sell at a profit - - these are the outstanding features of Milcor Products. They have built into them every possible assistance to your business that products alone can give.

Compare every single item in the unusually large Milcor Line and you will find that each one is made better. And you can be sure Milcor prices are right! Write for information.

# MILCOR STEEL COMPANY

MILWAUKEE, WIS., 4117 W. Burnham Street

CHICAGO, ILL.

KANSAS CITY, MO.

CANTON, OHIO

LA CROSSE, WIS.

Sales Offices

New York, 418  
Pershing Square  
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Mass., 136 Fed-  
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